STIC Search Report
EIC 1700

STIC Database Tracking Number: 186019

TO:	From:
Ling Xu **Location: REM 5E74** **Art Unit : 1775** **April 28, 2006** **Case Serial Number: 10/690021**	**Mei Huang** **Location: EIC 1700** **REMSEN 4B28** **Phone: 571/272-3952** **Mei.huang@uspto.gov**

Search Notes

Examiner Xu,

Please feel free to contact me if you have any questions or if you would like to refine the search query,

Thank you for using STIC services!

Mei Huang

186019

SEARCH REQUEST FORM

Scientific and Technical Information Center

Examiner# : 77924
Art Unit : 1775
Phone Number: 272-1546
Date: 4/19/2006
Serial Number: 10/690,021
MailBox & Bldg/Room Location: Remsen 5e74
Results Format Preferred (circle): Paper Disk E-mail

If more than one search is submitted, please prioritize searches in order of need.

****

Please provide a detailed statement of the search topic, and describe as specifically as possible the subject matter to be searched. Include the elected species or structures, keywords, synonyms, acronyms, and registry numbers, and combine with the concept or utility of the invention. Define any terms that may have a special meaning. Give examples or relevant citations, authors, etc., if known. Please attach a copy of the coversheet, pertinent claims, and abstract.

Title of Invention:

Ferroelectric film, ferroelectric capacitor, ferroelectric memory, piezoelectric element, semiconductor element, method of manufacturing ferroelectric film, and method of manufacturing ferroelectric capacitor

Inventors (please provide full names):

Takeshi Kijima, Matsumoto-shi, JAPAN;
Yasuaki Hamada, Suwa-shi, JAPAN;
Eiji Natori, Chino-shi, JAPAN;Koji Ohashi, Chino-shi, JAPAN;

Earliest Priority Filing Date: 3/19/2003

For Sequence Searches Only Please include all pertinent information (parent, child, divisional, or issued patent numbers) along with the appropriate serial number.

Please search compound in claim 2, if not found, please extend to claim 1.

Please call me if you have any questions.

Thanks

Cindy Tu

Amendments to the Claims:

The following listing of claims will replace all prior versions, and listings, of claims in the application:

1. (Currently Amended) A ferroelectric film that is described by a general formula $(Pb,A)(B_{1-x}Nb_x)O_3$,

wherein an A element ~~comprises at least one of La, Ce, Pr, Nd, Pm, Sm, Eu, Gd, Tb, Dy, Ho, Er, Tm, Yb and Lu~~ consists of an element selected from the group consisting of Ce, Pr, Nd, Pm, Sm, Eu, Gd, Tb, Dy, Ho, Er, Tm, Yb and Lu, LNTH/PG

wherein a B element comprises at least one of Zr, Ti, V, W, Hf and Ta, and

wherein x is within the range of: $0.05 \leq x \leq 0.4$.

2. (Currently Amended) A ferroelectric film that is described by $(Pb_{1-y}A_y)(B_{1-x}Nb_x)O_3$,

wherein an A element ~~comprises at least one of La, Ce, Pr, Nd, Pm, Sm, Eu, Gd, Tb, Dy, Ho, Er, Tm, Yb and Lu~~ consists of an element selected from the group consisting of Ce, Pr, Nd, Pm, Sm, Eu, Gd, Tb, Dy, Ho, Er, Tm, Yb and Lu,

wherein y is within the range of: $0 < y \leq 0.2$,

wherein a B element comprises at least one of Zr, Ti, V, W, Hf and Ta, and

wherein x is within the range of: $0.05 \leq x \leq 0.4$.

3-7. (Canceled)

8. (Currently Amended) The ferroelectric film as defined by claim 1, further comprising:

Si, Ge or Si and Ge.

9. (Currently Amended) The ferroelectric film as defined by claim 1, further comprising:

Si, Ge or Si and Ge of from about 0.5 mol% to about 5 mol%.

10-23. (Canceled)

24. (Previously Presented) A ferroelectric memory device comprising:

a substrate;

a transistor formed on the substrate; and

a ferroelectric capacitor formed above the substrate,

wherein the ferroelectric capacitor comprises a ferroelectric film as defined by claim 1.

25. (Previously Presented) A piezoelectric actuator comprising:

a substrate; and

a piezoelectric element formed above the substrate,

wherein the piezoelectric element comprises a ferroelectric film as defined by claim 1.

26. (Canceled)

27. (Currently Amended) The ferroelectric film as defined by claim 2, further comprising:

Si, Ge or Si and Ge.

28. (Currently Amended) The ferroelectric film as defined by claim 2, further comprising:

Si, Ge or Si and Ge of from about 0.5 mol% to about 5 mol%.

29. (Previously Presented) A ferroelectric memory device comprising:

a substrate;

a transistor formed on the substrate; and

a ferroelectric capacitor formed above the substrate,

wherein the ferroelectric capacitor comprises a ferroelectric film as defined by claim 2.

30. (Previously Presented) A piezoelectric actuator comprising:

a substrate; and

a piezoelectric element formed above the substrate,

wherein the piezoelectric element comprises a ferroelectric film as defined by claim 2.

31. (New) The ferroelectric film as defined by claim 1, wherein the B element comprises at least Zr and Ti, and optionally further includes any of V, W, Hf or Ta, and wherein a mol% of Ti is greater than a mol% of Zr.

32. (New) The ferroelectric film as defined by claim 2, wherein the B element comprises at least Zr and Ti, and optionally further includes any of V, W, Hf or Ta, and wherein a mol% of Ti is greater than a mol% of Zr.

STIC Search Results Feedback Form

USPTO

EIC17000

Questions about the scope or the results of the search? Contact *the EIC searcher or contact*:

Kathleen Fuller, EIC 1700 Team Leader
571/272-2505 REMSEN 4B28

Voluntary Results Feedback Form

- *I am an examiner in Workgroup:* ☐ *Example: 1713*
- *Relevant prior art* ***found****, search results used as follows:*
  - ☐ 102 rejection
  - ☐ 103 rejection
  - ☐ Cited as being of interest.
  - ☐ Helped examiner better understand the invention.
  - ☐ Helped examiner better understand the state of the art in their technology.

Types of relevant prior art found:

- ☐ Foreign Patent(s)
- ☐ Non-Patent Literature
  (journal articles, conference proceedings, new product announcements etc.)

- *Relevant prior art* ***not found:***
  - ☐ Results verified the lack of relevant prior art (helped determine patentability).
  - ☐ Results were not useful in determining patentability or understanding the invention.

Comments:

Drop off or send completed forms to EIC1700 REMSEN 4B28

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=> => fil reg
FILE 'REGISTRY' ENTERED AT 15:08:46 ON 28 APR 2006
USE IS SUBJECT TO THE TERMS OF YOUR STN CUSTOMER AGREEMENT.
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=> d his ful

     (FILE 'HOME' ENTERED AT 13:41:07 ON 28 APR 2006)

     FILE 'HCAPLUS' ENTERED AT 13:41:29 ON 28 APR 2006
                E US20040214352/PN
L1            1 SEA US2004214352/PN
                D IALL
                SEL RN

     FILE 'REGISTRY' ENTERED AT 13:46:20 ON 28 APR 2006
L2            2 SEA (683745-93-9/BI OR 683745-94-0/BI)
                D SCA
L3         1319 SEA (PB(L)(CE OR PR OR ND OR PM OR SM OR EU OR GD OR TB
                OR DY OR HO OR ER OR TM OR YB OR LU)(L)(ZR OR TI OR V OR
                W OR HF OR TA)(L)NB(L)O)/ELS
L4           91 SEA L3(L)5/ELC.SUB
L5            0 SEA L2 AND L4
L6          120 SEA L3(L)6/ELC.SUB

     FILE 'HCAPLUS' ENTERED AT 14:31:35 ON 28 APR 2006
L7           51 SEA L4
L8        64664 SEA FERROELEC# OR FERRO(A)ELEC# OR FERROELECTRIC? OR
                FERRO(A)ELECTRIC?
L9           41 SEA L7 AND L8
L10       12742 SEA L8(2A)(FILM? OR THINFILM? OR LAYER? OR OVERLAY? OR
                OVERLAID? OR LAMIN? OR LAMEL? OR (MULTILAYER?) OR SHEET?
                OR LEAF? OR FOIL? OR COAT? OR TOPCOAT? OR OVERCOAT? OR
                VENEER? OR SHEATH? OR COVER? OR ENVELOP? OR ENCAS? OR
                ENWRAP? OR OVERSPREAD?)
L11          11 SEA L7 AND L10

     FILE 'REGISTRY' ENTERED AT 14:56:18 ON 28 APR 2006
L12       12175 SEA (PB(L)(ZR OR TI OR V OR W OR HF OR TA)(L)NB(L)O)/ELS

L13        1245 SEA L12(L)4-5/ELC.SUB
L14        1245 SEA L13 AND TIS/CI

     FILE 'HCAPLUS' ENTERED AT 14:59:31 ON 28 APR 2006
L15        2095 SEA L14
L16        1268 SEA L15 AND L8
L17         172 SEA L15 AND L10
L18         107 SEA L17 AND (1840-2002/PY OR 1840-2002/PRY)
L19          41 SEA L9 OR L11
L20          30 SEA L19 NOT L11
L21          51 SEA L7 OR L19
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L22 10 SEA L21 NOT L19

FILE 'REGISTRY' ENTERED AT 15:08:46 ON 28 APR 2006

=> fil hcap
FILE 'HCAPLUS' ENTERED AT 15:08:53 ON 28 APR 2006

=> d l11 ibib abs hitstr hitind 1-11

L11 ANSWER 1 OF 11 HCAPLUS COPYRIGHT 2006 ACS on STN
ACCESSION NUMBER: 2005:1158978 HCAPLUS
DOCUMENT NUMBER: 144:161603
TITLE: Dielectric nonlinearity of (100) oriented PYbN-PT thin films
AUTHOR(S): Gharb, N. Bassiri; Trolier-McKinstry, S.
CORPORATE SOURCE: Materials Research Institute and Materials Science and Engineering Department, The Pennsylvania State University, University Park, PA, 16802, USA
SOURCE: IEEE International Symposium on Applications of Ferroelectrics--ISAF-04, 14th, Montreal, QC, Canada, Aug. 23-27, 2004 ((2005)), Meeting Date 2004, 95-97. Editor(s): Yuhas, Marjorie Passini. Institute of Electrical and Electronics Engineers: New York, N. Y. CODEN: 69HMMI; ISBN: 0-7803-8410-5
DOCUMENT TYPE: Conference
LANGUAGE: English
AB The extrinsic contributions to the dielec. response of 0.5Pb(Yb1/2Nb1/2)O3-0.5PbTiO3 thin films with (100) crystallog. orientation were studied (all indexes are given in terms of the pseudo-cubic cell). At 30kV/cm, the irreversible contribution in the (100) oriented PYbN-PT films supplies 34% of the total dielec. response of the film. The dielec. nonlinearity of the films showed almost no variation with application of mech. stress on the films.
IT **170965-44-3**, Lead niobium titanium ytterbium oxide (PbNb0.25Ti0.5Yb0.25O3)
RL: PRP (Properties); TEM (Technical or engineered material use); USES (Uses)
(dielec. nonlinearity of (100) oriented 0.5Pb(Yb1/2Nb1/2)O3-0.5PbTiO3 thin films)
RN 170965-44-3 HCAPLUS
CN Lead niobium titanium ytterbium oxide (PbNb0.25Ti0.5Yb0.25O3) (9CI) (CA INDEX NAME)

Component	Ratio	Component

		Registry Number
O	3	17778-80-2
Yb	0.25	7440-64-4
Ti	0.5	7440-32-6
Nb	0.25	7440-03-1
Pb	1	7439-92-1

CC 76-9 (Electric Phenomena)
IT Crystal structure
Dielectric constant
Ferroelectric films
(dielec. nonlinearity of (100) oriented 0.5Pb(Yb1/2Nb1/2)O3-0.5PbTiO3 thin films)
IT **170965-44-3**, Lead niobium titanium ytterbium oxide (PbNb0.25Ti0.5Yb0.25O3)
RL: PRP (Properties); TEM (Technical or engineered material use); USES (Uses)
(dielec. nonlinearity of (100) oriented 0.5Pb(Yb1/2Nb1/2)O3-0.5PbTiO3 thin films)
REFERENCE COUNT: 22 THERE ARE 22 CITED REFERENCES AVAILABLE FOR THIS RECORD. ALL CITATIONS AVAILABLE IN THE RE FORMAT

L11 ANSWER 2 OF 11 HCAPLUS COPYRIGHT 2006 ACS on STN
ACCESSION NUMBER: 2005:984691 HCAPLUS
DOCUMENT NUMBER: 144:62329
TITLE: High performance piezoelectric films for high frequency MEMS ultrasonic transducers
AUTHOR(S): Zhang, Q. Q.; Djuth, F. T.; Zhou, Q. F.; Shung, K. K.
CORPORATE SOURCE: Geospace Research, Inc., El Segundo, CA, 90245, USA
SOURCE: Proceedings - IEEE Ultrasonics Symposium (2004), (Vol. 3), 1954-1957
CODEN: PIEUEZ; ISSN: 1051-0117
PUBLISHER: Institute of Electrical and Electronics Engineers
DOCUMENT TYPE: Journal
LANGUAGE: English
AB (1-X)Pb[Yb1/2Nb1/2]O3-xPbTiO3 (PYbN-PT, x = 0.5) thin films were studied for high frequency transducer applications. Firstly, highly (001) oriented LaNiO3 (LNO) thin films were prepd. on Si (001) substrates by a simple metal org. decompn. technique. The room temp. resistivity of the LNO thin films was 0.65 mΩ.cm. Then PYbN-PT thin films were deposited onto the LNO/Si substrates by sol-gel processing. X-ray diffraction anal. revealed that the films of PYbN-PT were highly (001) oriented along the LNO/Si substrates. The films had a uniform grain size of .apprx.80-120 nm. At 1 KHz, the dielec. permittivity was 920, and dielec. loss is .apprx.0.035. The **ferroelec. films** displayed good P-E hysteresis characteristics and better temp. stabilization compared

with films that have lower Curie temp. Finally, following PiezoCAD modeling, the PYbN-PT film high frequency transducer was designed.

IT **170965-44-3**, Lead niobium titanium ytterbium oxide (PbNb0.25Ti0.5Yb0.25O3)
RL: DEV (Device component use); USES (Uses)
(high performance piezoelec. films for high frequency microelectromech. system ultrasonic transducers)

RN 170965-44-3 HCAPLUS

CN Lead niobium titanium ytterbium oxide (PbNb0.25Ti0.5Yb0.25O3) (9CI) (CA INDEX NAME)

Component	Ratio	Component Registry Number
O	3	17778-80-2
Yb	0.25	7440-64-4
Ti	0.5	7440-32-6
Nb	0.25	7440-03-1
Pb	1	7439-92-1

CC 76-7 (Electric Phenomena)
Section cross-reference(s): 57

IT 12031-63-9, Lithium niobium oxide (LiNbO3) 12034-65-0, Lead niobium ytterbium oxide (PbNb0.5Yb0.5O3) 12060-00-3, Lead titanium oxide (PbTiO3) **170965-44-3**, Lead niobium titanium ytterbium oxide (PbNb0.25Ti0.5Yb0.25O3)
RL: DEV (Device component use); USES (Uses)
(high performance piezoelec. films for high frequency microelectromech. system ultrasonic transducers)

REFERENCE COUNT: 7 THERE ARE 7 CITED REFERENCES AVAILABLE FOR THIS RECORD. ALL CITATIONS AVAILABLE IN THE RE FORMAT

L11 ANSWER 3 OF 11 HCAPLUS COPYRIGHT 2006 ACS on STN

ACCESSION NUMBER: 2005:486569 HCAPLUS

DOCUMENT NUMBER: 143:204078

TITLE: Structure and electrical properties of sol-gel-derived (001)-oriented Pb[Yb1/2Nb1/2]O3-PbTiO3 thin films grown on LaNbO3/Si(001) substrates

AUTHOR(S): Zhou, Q. F.; Shung, K. K.; Zhang, Q. Q.; Djuth, F. T.

CORPORATE SOURCE: NIH Transducer Resource Center, Department of Biomedical Engineering, University of Southern California, Los Angeles, CA, 90089-1451, USA

SOURCE: Journal of Applied Physics (2005), 97(10, Pt. 1), 104103/1-104103/4
CODEN: JAPIAU; ISSN: 0021-8979

PUBLISHER: American Institute of Physics

DOCUMENT TYPE: Journal

LANGUAGE: English

AB (1-X)Pb[Yb1/2Nb1/2]O3-xPbTiO3 (PYbN-PT, x = 0.5) oriented thin films

were deposited onto LaNiO3 (LNO)/Si substrates by sol-gel processing. Highly (001)-oriented LNO thin films were prepd. by a simple metal-org. decompn. technique when sample annealed at 650° using a rapid thermal annealing. The room-temp. resistivity of LNO thin films was 0.65 mΩ cm. X-ray diffraction anal. revealed that the films of PYbN-PT were highly (001) oriented along LNO/Si substrates. No pyrochlore phase was obsd. by x-ray diffraction and films had a uniform grain size of .apprx.80-120 nm. At 1 kHz, the dielec. permittivity was 920 and dielec. loss is .apprx.0.035. The **ferroelec. films** displayed good P-E hysteresis characteristic and better temp. stabilization compared with the films that have low Curie temp.

IT **170965-44-3**, Lead niobium titanium ytterbium oxide (PbNb0.25Ti0.5Yb0.25O3)
RL: PRP (Properties)
(structure and elec. properties of sol-gel-derived oriented Pb[Yb1/2Nb1/2]O3-PbTiO3 thin films grown on LaNbO3/Si(001) substrates)

RN 170965-44-3 HCAPLUS

CN Lead niobium titanium ytterbium oxide (PbNb0.25Ti0.5Yb0.25O3) (9CI) (CA INDEX NAME)

Component	Ratio	Component Registry Number
O	3	17778-80-2
Yb	0.25	7440-64-4
Ti	0.5	7440-32-6
Nb	0.25	7440-03-1
Pb	1	7439-92-1

CC 76-8 (Electric Phenomena)

IT Annealing
Curie temperature (ferroelectric)
Dielectric constant
Dielectric hysteresis
Dielectric loss
Electric resistance
Ferroelectric films
Ferroelectricity
X-ray diffraction
(structure and elec. properties of sol-gel-derived oriented Pb[Yb1/2Nb1/2]O3-PbTiO3 thin films grown on LaNbO3/Si(001) substrates)

IT 12034-65-0, Lead niobium ytterbium oxide (PbNb0.5Yb0.5O3) 12060-00-3, Lead titanium oxide (PbTiO3) **170965-44-3**, Lead niobium titanium ytterbium oxide (PbNb0.25Ti0.5Yb0.25O3)
RL: PRP (Properties)
(structure and elec. properties of sol-gel-derived oriented Pb[Yb1/2Nb1/2]O3-PbTiO3 thin films grown on LaNbO3/Si(001) substrates)

REFERENCE COUNT: 19 THERE ARE 19 CITED REFERENCES AVAILABLE FOR THIS RECORD. ALL CITATIONS AVAILABLE IN THE RE FORMAT

L11 ANSWER 4 OF 11 HCAPLUS COPYRIGHT 2006 ACS on STN
ACCESSION NUMBER: 2004:334112 HCAPLUS
DOCUMENT NUMBER: 141:341267
TITLE: Impact of Structure Ordering and Defects on Properties of Complex Ferroelectric Perovskites
AUTHOR(S): Sternberg, A.; Antonova, M.; Livinsh, M.; Dambekalne, M.; Kundzins, K.; Haessler, W.; Bittner, R.; Weber, H.
CORPORATE SOURCE: Institute of Solid State Physics, University of Latvia, Riga, LV-1063, Latvia
SOURCE: Ferroelectrics (2004), 298, 283-288
CODEN: FEROA8; ISSN: 0015-0193
PUBLISHER: Taylor & Francis, Inc.
DOCUMENT TYPE: Journal
LANGUAGE: English

AB Influence of the structure ordering, modification and defects on the properties in ferroelec. ceramics and thin films are investigated. Structural changes in perovskite type compds. with general formula (1-x)Pb(B3+,Nb)TiO3-xPbTiO3 are realized by variation of it compn. (by exchange of ions B3+ in B sublattice). The crystallog. features of Pb(Lu1/2Nb1/2)O3-PbTiO3 (PLuNT) and PbSc1/2Nb1/2O3-PbLu1/2Nb1/2O3 (PSN-PLuN) compds. are discussed with respect to dielec., polarization and electro-mech. properties. The heterovalent substitution of Pb2+ by La3+ in PLuNT ceramics either in both components and maintaining the PbTiO3 unmodified shifts the MPB to the pseudomonoclinic side of phase diagram. The initial unmodified material "softens", coercive field Ec decreases and simultaneously high values of max. and remnant polarization are characteristic. Antiferroelec. thin films display higher radiation resistance than ferroelec. heterostructures up to a neutron fluence of 2*1022 m-2 (E > 0.1 MeV). The strong dependence of radiation-induced change of properties on the quality of the films (epitaxial vs. polycryst.) was found.

IT **263871-47-2**, Lead lutetium niobium titanium oxide (PbLu0-0.5Nb0-0.5Ti0-1O3) **273750-91-7**, Lead lutetium niobium titanium oxide (PbLu0.32Nb0.32Ti0.36O3)
RL: PRP (Properties)
(impact of structure ordering and defects on properties of complex ferroelec. perovskites)

RN 263871-47-2 HCAPLUS
CN Lead lutetium niobium titanium oxide (PbLu0-0.5Nb0-0.5Ti0-1O3) (9CI) (CA INDEX NAME)

Component	Ratio	Component Registry Number
O	3	17778-80-2
Ti	0 - 1	7440-32-6

Nb	0 - 0.5	7440-03-1
Lu	0 - 0.5	7439-94-3
Pb	1	7439-92-1

RN 273750-91-7 HCAPLUS
CN Lead lutetium niobium titanium oxide (PbLu0.32Nb0.32Ti0.36O3) (9CI) (CA INDEX NAME)

Component	Ratio	Component Registry Number
O	3	17778-80-2
Ti	0.36	7440-32-6
Nb	0.32	7440-03-1
Lu	0.32	7439-94-3
Pb	1	7439-92-1

CC 76-8 (Electric Phenomena)
Section cross-reference(s): 75
ST **ferroelec** perovskite ceramics **film** structure ordering defect dielec property
IT Annealing
Cation exchange
Crystal defects
Crystal structure-property relationship
Crystal vacancies
Dielectric constant
Dielectric hysteresis
Dielectric polarization
Ferroelectric films
Ferroelectricity
Order-disorder transition
Perovskite-type crystals
Phase diagram
Radiation hardness
Radiation induced crystal defects
(impact of structure ordering and defects on properties of complex ferroelec. perovskites)
IT **263871-47-2**, Lead lutetium niobium titanium oxide (PbLu0-0.5Nb0-0.5Ti0-1O3) **273750-91-7**, Lead lutetium niobium titanium oxide (PbLu0.32Nb0.32Ti0.36O3) 773157-65-6, Lead lutetium niobium scandium oxide (Pb(Lu,Sc)0.5Nb0.5O3)
RL: PRP (Properties)
(impact of structure ordering and defects on properties of complex ferroelec. perovskites)
REFERENCE COUNT: 4 THERE ARE 4 CITED REFERENCES AVAILABLE FOR THIS RECORD. ALL CITATIONS AVAILABLE IN THE RE FORMAT

L11 ANSWER 5 OF 11 HCAPLUS COPYRIGHT 2006 ACS on STN
ACCESSION NUMBER: 2003:566522 HCAPLUS
DOCUMENT NUMBER: 139:205832

TITLE: Ceramics and thin films of some new Pb(B3+,Nb)TiO3-PbTiO3 systems
AUTHOR(S): Sternberg, A.; Shebanovs, L.; Zauls, V.; Kundzins, K.
CORPORATE SOURCE: Institute of Solid State Physics, University of Latvia, Riga, LV-1063, Latvia
SOURCE: Ferroelectrics (2003), 286, 327-334
CODEN: FEROA8; ISSN: 0015-0193
PUBLISHER: Taylor & Francis, Inc.
DOCUMENT TYPE: Journal
LANGUAGE: English

AB The structure, dielec., and electromech. properties of (1 - x)Pb(B3+,Nb)TiO3-xPbTiO3 binary systems (B = Lu, Er, Tb, Ho) are reported. The crystallog. features at the morphotropic phase boundary (MPB) between tetragonal P4mm and pseudo-monoclinic M phases are discussed with respect to electromech. properties. Doping effect (with La3+) on the properties of ceramic samples of pseudobinary Pb(Lu1/2Nb1/2)O3-PbTiO3 (PLuNT) system was studied. Pb(Mg1/3Nb2/3)-PbTiO3 (PT) solid solns. were studied under different processing conditions for obtaining ceramics of 100% perovskite structure with sufficient high ΔTEC .apprx. 1 K near room temp. The PLuNT with compn. near the MPB formed by in situ pulsed laser deposition onto LSCO/(100)MgO as well as PluN thin **films** exhibit **ferroelec.** behavior at room temp. (in contrast to typical antiferroelec. features of PLuN ceramic).

IT **233685-93-3**, Erbium lead niobium titanium oxide (Er0.45PbNb0.45Ti0.1O3) **233685-94-4**, Erbium lead niobium titanium oxide (Er0.4PbNb0.4Ti0.2O3) **233685-95-5**, Erbium lead niobium titanium oxide (Er0.35PbNb0.35Ti0.3O3) **233685-97-7**, Erbium lead niobium titanium oxide (Er0.3PbNb0.3Ti0.4O3) **233685-99-9**, Erbium lead niobium titanium oxide (Er0.25PbNb0.25Ti0.5O3) **233686-00-5**, Erbium lead niobium titanium oxide (Er0.2PbNb0.2Ti0.6O3) **233686-01-6**, Erbium lead niobium titanium oxide (Er0.15PbNb0.15Ti0.7O3) **233686-02-7**, Erbium lead niobium titanium oxide (Er0.1PbNb0.1Ti0.8O3) **263872-43-1**, Lead lutetium niobium titanium oxide (PbLu0.45Nb0.45Ti0.1O3) **263872-44-2**, Lead lutetium niobium titanium oxide (PbLu0.4Nb0.4Ti0.2O3) **267409-80-3**, Lead lutetium niobium titanium oxide (PbLu0.3Nb0.3Ti0.4O3) **273750-90-6**, Lead lutetium niobium titanium oxide (PbLu0.35Nb0.35Ti0.3O3) **273750-91-7**, Lead lutetium niobium titanium oxide (PbLu0.32Nb0.32Ti0.36O3) **273750-93-9**, Lead lutetium niobium titanium oxide (PbLu0.25Nb0.25Ti0.5O3) **273750-94-0**, Lead lutetium niobium titanium oxide (PbLu0.2Nb0.2Ti0.6O3) **273750-95-1**, Lead lutetium niobium titanium oxide (PbLu0.15Nb0.15Ti0.7O3) **273750-96-2**, Lead lutetium niobium titanium oxide (PbLu0.1Nb0.1Ti0.8O3)
RL: PRP (Properties)
(prepn. and properties of **ferroelec.** ceramics and **films** of lead lanthanide niobate titanate)

RN 233685-93-3 HCAPLUS

CN Erbium lead niobium titanium oxide (Er0.45PbNb0.45Ti0.1O3) (9CI) (CA INDEX NAME)

Component	Ratio	Component Registry Number
O	3	17778-80-2
Er	0.45	7440-52-0
Ti	0.1	7440-32-6
Nb	0.45	7440-03-1
Pb	1	7439-92-1

RN 233685-94-4 HCAPLUS
CN Erbium lead niobium titanium oxide (Er0.4PbNb0.4Ti0.2O3) (9CI) (CA INDEX NAME)

Component	Ratio	Component Registry Number
O	3	17778-80-2
Er	0.4	7440-52-0
Ti	0.2	7440-32-6
Nb	0.4	7440-03-1
Pb	1	7439-92-1

RN 233685-95-5 HCAPLUS
CN Erbium lead niobium titanium oxide (Er0.35PbNb0.35Ti0.3O3) (9CI) (CA INDEX NAME)

Component	Ratio	Component Registry Number
O	3	17778-80-2
Er	0.35	7440-52-0
Ti	0.3	7440-32-6
Nb	0.35	7440-03-1
Pb	1	7439-92-1

RN 233685-97-7 HCAPLUS
CN Erbium lead niobium titanium oxide (Er0.3PbNb0.3Ti0.4O3) (9CI) (CA INDEX NAME)

Component	Ratio	Component Registry Number
O	3	17778-80-2
Er	0.3	7440-52-0
Ti	0.4	7440-32-6
Nb	0.3	7440-03-1
Pb	1	7439-92-1

RN 233685-99-9 HCAPLUS

CN Erbium lead niobium titanium oxide (Er0.25PbNb0.25Ti0.5O3) (9CI) (CA INDEX NAME)

Component	Ratio	Component Registry Number
O	3	17778-80-2
Er	0.25	7440-52-0
Ti	0.5	7440-32-6
Nb	0.25	7440-03-1
Pb	1	7439-92-1

RN 233686-00-5 HCAPLUS
CN Erbium lead niobium titanium oxide (Er0.2PbNb0.2Ti0.6O3) (9CI) (CA INDEX NAME)

Component	Ratio	Component Registry Number
O	3	17778-80-2
Er	0.2	7440-52-0
Ti	0.6	7440-32-6
Nb	0.2	7440-03-1
Pb	1	7439-92-1

RN 233686-01-6 HCAPLUS
CN Erbium lead niobium titanium oxide (Er0.15PbNb0.15Ti0.7O3) (9CI) (CA INDEX NAME)

Component	Ratio	Component Registry Number
O	3	17778-80-2
Er	0.15	7440-52-0
Ti	0.7	7440-32-6
Nb	0.15	7440-03-1
Pb	1	7439-92-1

RN 233686-02-7 HCAPLUS
CN Erbium lead niobium titanium oxide (Er0.1PbNb0.1Ti0.8O3) (9CI) (CA INDEX NAME)

Component	Ratio	Component Registry Number
O	3	17778-80-2
Er	0.1	7440-52-0
Ti	0.8	7440-32-6
Nb	0.1	7440-03-1
Pb	1	7439-92-1

RN 263872-43-1 HCAPLUS

CN Lead lutetium niobium titanium oxide (PbLu0.45Nb0.45Ti0.1O3) (9CI) (CA INDEX NAME)

Component	Ratio	Component Registry Number
O	3	17778-80-2
Ti	0.1	7440-32-6
Nb	0.45	7440-03-1
Lu	0.45	7439-94-3
Pb	1	7439-92-1

RN 263872-44-2 HCAPLUS
CN Lead lutetium niobium titanium oxide (PbLu0.4Nb0.4Ti0.2O3) (9CI) (CA INDEX NAME)

Component	Ratio	Component Registry Number
O	3	17778-80-2
Ti	0.2	7440-32-6
Nb	0.4	7440-03-1
Lu	0.4	7439-94-3
Pb	1	7439-92-1

RN 267409-80-3 HCAPLUS
CN Lead lutetium niobium titanium oxide (PbLu0.3Nb0.3Ti0.41O3) (9CI) (CA INDEX NAME)

Component	Ratio	Component Registry Number
O	3	17778-80-2
Ti	0.41	7440-32-6
Nb	0.3	7440-03-1
Lu	0.3	7439-94-3
Pb	1	7439-92-1

RN 273750-90-6 HCAPLUS
CN Lead lutetium niobium titanium oxide (PbLu0.35Nb0.35Ti0.3O3) (9CI) (CA INDEX NAME)

Component	Ratio	Component Registry Number
O	3	17778-80-2
Ti	0.3	7440-32-6
Nb	0.35	7440-03-1
Lu	0.35	7439-94-3
Pb	1	7439-92-1

RN 273750-91-7 HCAPLUS

CN Lead lutetium niobium titanium oxide (PbLu0.32Nb0.32Ti0.3O3) (9CI) (CA INDEX NAME)

Component	Ratio	Component Registry Number
O	3	17778-80-2
Ti	0.36	7440-32-6
Nb	0.32	7440-03-1
Lu	0.32	7439-94-3
Pb	1	7439-92-1

RN 273750-93-9 HCAPLUS
CN Lead lutetium niobium titanium oxide (PbLu0.25Nb0.25Ti0.5O3) (9CI) (CA INDEX NAME)

Component	Ratio	Component Registry Number
O	3	17778-80-2
Ti	0.5	7440-32-6
Nb	0.25	7440-03-1
Lu	0.25	7439-94-3
Pb	1	7439-92-1

RN 273750-94-0 HCAPLUS
CN Lead lutetium niobium titanium oxide (PbLu0.2Nb0.2Ti0.6O3) (9CI) (CA INDEX NAME)

Component	Ratio	Component Registry Number
O	3	17778-80-2
Ti	0.6	7440-32-6
Nb	0.2	7440-03-1
Lu	0.2	7439-94-3
Pb	1	7439-92-1

RN 273750-95-1 HCAPLUS
CN Lead lutetium niobium titanium oxide (PbLu0.15Nb0.15Ti0.7O3) (9CI) (CA INDEX NAME)

Component	Ratio	Component Registry Number
O	3	17778-80-2
Ti	0.7	7440-32-6
Nb	0.15	7440-03-1
Lu	0.15	7439-94-3
Pb	1	7439-92-1

RN 273750-96-2 HCAPLUS

CN Lead lutetium niobium titanium oxide (PbLu0.1Nb0.1Ti0.8O3) (9CI) (CA INDEX NAME)

Component	Ratio	Component Registry Number
O	3	17778-80-2
Ti	0.8	7440-32-6
Nb	0.1	7440-03-1
Lu	0.1	7439-94-3
Pb	1	7439-92-1

CC 76-8 (Electric Phenomena)
Section cross-reference(s): 57, 75

IT Ferroelectric materials
(ceramic; prepn. and properties of **ferroelec.** ceramics and **films** of lead lanthanide niobate titanate)

IT Antiferroelectricity
Dielectric hysteresis
Ferroelectric films
Ferroelectric transition
Ferroelectricity
Perovskite-type crystals
Phase diagram
Piezoelectricity
Pyroelectricity
(prepn. and properties of **ferroelec.** ceramics and **films** of lead lanthanide niobate titanate)

IT 12032-01-8, Lead lutetium niobium oxide (Pb2LuNbO6) 12060-00-3, Lead titanium oxide (PbTiO3) 12434-07-0, Erbium lead niobium oxide (ErPb2NbO6) **233685-93-3**, Erbium lead niobium titanium oxide (Er0.45PbNb0.45Ti0.1O3) **233685-94-4**, Erbium lead niobium titanium oxide (Er0.4PbNb0.4Ti0.2O3) **233685-95-5**, Erbium lead niobium titanium oxide (Er0.35PbNb0.35Ti0.3O3) **233685-97-7**, Erbium lead niobium titanium oxide (Er0.3PbNb0.3Ti0.4O3) **233685-99-9**, Erbium lead niobium titanium oxide (Er0.25PbNb0.25Ti0.5O3) **233686-00-5**, Erbium lead niobium titanium oxide (Er0.2PbNb0.2Ti0.6O3) **233686-01-6**, Erbium lead niobium titanium oxide (Er0.15PbNb0.15Ti0.7O3) **233686-02-7**, Erbium lead niobium titanium oxide (Er0.1PbNb0.1Ti0.8O3) **263872-43-1**, Lead lutetium niobium titanium oxide (PbLu0.45Nb0.45Ti0.1O3) **263872-44-2**, Lead lutetium niobium titanium oxide (PbLu0.4Nb0.4Ti0.2O3) **267409-80-3**, Lead lutetium niobium titanium oxide (PbLu0.3Nb0.3Ti0.4O3) **273750-90-6**, Lead lutetium niobium titanium oxide (PbLu0.35Nb0.35Ti0.3O3) **273750-91-7**, Lead lutetium niobium titanium oxide (PbLu0.32Nb0.32Ti0.36O3) **273750-93-9**, Lead lutetium niobium titanium oxide (PbLu0.25Nb0.25Ti0.5O3) **273750-94-0**, Lead lutetium niobium titanium oxide (PbLu0.2Nb0.2Ti0.6O3) **273750-95-1**, Lead lutetium niobium titanium oxide (PbLu0.15Nb0.15Ti0.7O3) **273750-96-2**, Lead lutetium niobium

titanium oxide (PbLu0.1Nb0.1Ti0.8O3)
RL: PRP (Properties)
(prepn. and properties of **ferroelec.** ceramics and **films** of lead lanthanide niobate titanate)

REFERENCE COUNT: 8 THERE ARE 8 CITED REFERENCES AVAILABLE FOR THIS RECORD. ALL CITATIONS AVAILABLE IN THE RE FORMAT

L11 ANSWER 6 OF 11 HCAPLUS COPYRIGHT 2006 ACS on STN
ACCESSION NUMBER: 2003:498131 HCAPLUS
DOCUMENT NUMBER: 139:205805
TITLE: Dielectric and transverse piezoelectric properties of sol-gel-derived (001) Pb[Yb1/2Nb1/2]O3-PbTiO3 epitaxial thin films
AUTHOR(S): Zhou, Q. F.; Zhang, Q. Q.; Yoshimura, T.; Trolier-McKinstry, S.
CORPORATE SOURCE: Materials Research Institute, The Pennsylvania State University, University Park, PA, 16802, USA
SOURCE: Applied Physics Letters (2003), 82(26), 4767-4769
CODEN: APPLAB; ISSN: 0003-6951
PUBLISHER: American Institute of Physics
DOCUMENT TYPE: Journal
LANGUAGE: English

AB (1-X)Pb[Yb1/2Nb1/2]O3-xPbTiO3 (PYbN-PT, x=0.5) epitaxial thin films were deposited on (001) SrRuO3/(001) MgO substrates by sol-gel processing. X-ray diffraction anal. revealed that the films were pyrochlore-free (001) epitaxial films when crystd. at 750°C for 1 min. The dielec. permittivity and loss factor varied only slightly with frequency in the range of 100 to 10 000 Hz. At 1 kHz, the dielec. permittivity was 870 and the dielec. loss was 0.03 at room temp. Compared with (111) PYbN-PT films, (001) PYbN-PT **films** exhibited better **ferroelec.** and piezoelec. properties. The remanent polarization (Pr) was 37 μC/cm2. The effective transverse piezoelec. e31,f coeff. of the films were -10.2 C/m2 when films were poled at room temp. Enhanced piezoelec. properties were obtained using unique two-step method poling the PYbN-PT films at higher temps.

IT **170965-44-3P**, Lead niobium titanium ytterbium oxide PbNb0.25Ti0.5Yb0.25O3
RL: PNU (Preparation, unclassified); PRP (Properties); PREP (Preparation)
(dielec. and transverse piezoelec. properties of sol-gel-derived (001) Pb[Yb1/2Nb1/2]O3-PbTiO3 epitaxial thin films)

RN 170965-44-3 HCAPLUS
CN Lead niobium titanium ytterbium oxide (PbNb0.25Ti0.5Yb0.25O3) (9CI) (CA INDEX NAME)

Component	Ratio	Component Registry Number

O	3	17778-80-2
Yb	0.25	7440-64-4
Ti	0.5	7440-32-6
Nb	0.25	7440-03-1
Pb	1	7439-92-1

CC 76-7 (Electric Phenomena)
IT **170965-44-3P**, Lead niobium titanium ytterbium oxide PbNb0.25Ti0.5Yb0.25O3
RL: PNU (Preparation, unclassified); PRP (Properties); PREP (Preparation)
(dielec. and transverse piezoelec. properties of sol-gel-derived (001) Pb[Yb1/2Nb1/2]O3-PbTiO3 epitaxial thin films)
REFERENCE COUNT: 21 THERE ARE 21 CITED REFERENCES AVAILABLE FOR THIS RECORD. ALL CITATIONS AVAILABLE IN THE RE FORMAT

L11 ANSWER 7 OF 11 HCAPLUS COPYRIGHT 2006 ACS on STN
ACCESSION NUMBER: 2002:719507 HCAPLUS
DOCUMENT NUMBER: 138:116004
TITLE: Growth and piezoelectric properties of Pb(Yb1/2Nb1/2)O3-PbTiO3 epitaxial films
AUTHOR(S): Yoshimura, Takeshi; Trolier-McKinstry, Susan
CORPORATE SOURCE: Materials Research Institute, The Pennsylvania State University, University Park, PA, 16802, USA
SOURCE: Journal of Applied Physics (2002), 92(7), 3979-3984
CODEN: JAPIAU; ISSN: 0021-8979
PUBLISHER: American Institute of Physics
DOCUMENT TYPE: Journal
LANGUAGE: English
AB Epitaxial films of (1-x)Pb(Yb1/2Nb1/2)O3-xPbTiO3 (PYbN-PT, x=0.4,0.5) with SrRuO3 bottom electrodes were prepd. on (100)LaAlO3, (100)SrTiO3, and (111)SrTiO3 substrates by pulsed laser deposition. It was found that vacuum annealing of the SrRuO3 before the deposition of PYbN-PT facilitated growth of perovskite PYbN-PT. With optimized growth conditions, (001) and (111) PYbN-PT epitaxial films with good phase purity were obtained in a range of 650-660 and 600-620°C, resp. The ferroelec. and transverse piezoelec. properties of these PYbN-PT films were investigated. In the (001) PYbN-PT (50/50) film, the highest remanent polarization (.apprx.30 μC/cm2) and e31,f piezoelec. coeff. (-14 C/m2) were obsd. The transition temp. of the (001) PYbN-PT (50/50) film was near 380°C.
IT **170965-40-9**, Lead niobium titanium ytterbium oxide PbNb0.3Ti0.4Yb0.3O3 **170965-44-3**, Lead niobium titanium ytterbium oxide PbNb0.25Ti0.5Yb0.25O3
RL: PEP (Physical, engineering or chemical process); PRP (Properties); PYP (Physical process); PROC (Process)
(growth and piezoelec. properties of Pb(Yb1/2Nb1/2)O3-PbTiO3 epitaxial films)

RN 170965-40-9 HCAPLUS
CN Lead niobium titanium ytterbium oxide (PbNb0.3Ti0.4Yb0.3O3) (9CI) (CA INDEX NAME)

Component	Ratio	Component Registry Number
O	3	17778-80-2
Yb	0.3	7440-64-4
Ti	0.4	7440-32-6
Nb	0.3	7440-03-1
Pb	1	7439-92-1

RN 170965-44-3 HCAPLUS
CN Lead niobium titanium ytterbium oxide (PbNb0.25Ti0.5Yb0.25O3) (9CI) (CA INDEX NAME)

Component	Ratio	Component Registry Number
O	3	17778-80-2
Yb	0.25	7440-64-4
Ti	0.5	7440-32-6
Nb	0.25	7440-03-1
Pb	1	7439-92-1

CC 76-7 (Electric Phenomena)
ST lead ytterbium niobium titanium oxide epitaxial **film** piezoelectricity **ferroelectricity**
IT Annealing
Dielectric constant
Dielectric hysteresis
Dielectric loss
Dielectric polarization
Epitaxial films
Ferroelectric films
Ferroelectricity
Piezoelectricity
(growth and piezoelec. properties of Pb(Yb1/2Nb1/2)O3-PbTiO3 epitaxial films)
IT **170965-40-9**, Lead niobium titanium ytterbium oxide PbNb0.3Ti0.4Yb0.3O3 **170965-44-3**, Lead niobium titanium ytterbium oxide PbNb0.25Ti0.5Yb0.25O3
RL: PEP (Physical, engineering or chemical process); PRP (Properties); PYP (Physical process); PROC (Process)
(growth and piezoelec. properties of Pb(Yb1/2Nb1/2)O3-PbTiO3 epitaxial films)
REFERENCE COUNT: 31 THERE ARE 31 CITED REFERENCES AVAILABLE FOR THIS RECORD. ALL CITATIONS AVAILABLE IN THE RE FORMAT

L11 ANSWER 8 OF 11 HCAPLUS COPYRIGHT 2006 ACS on STN

ACCESSION NUMBER: 2002:321346 HCAPLUS
DOCUMENT NUMBER: 137:55601
TITLE: Structure and piezoelectric properties of sol-gel-derived 0.5 Pb[Yb1/2Nb1/2]O3-0.5 PbTiO3 thin films
AUTHOR(S): Zhang, Q. Q.; Zhou, Q. F.; Trolier-McKinstry, S.
CORPORATE SOURCE: Geospace Research Incorporated, El Segundo, CA, 90245, USA
SOURCE: Applied Physics Letters (2002), 80(18), 3370-3372
CODEN: APPLAB; ISSN: 0003-6951
PUBLISHER: American Institute of Physics
DOCUMENT TYPE: Journal
LANGUAGE: English

AB 0.5 Pb[Yb1/2Nb1/2]O3-0.5 PbTiO3 thin films were deposited on (111) Pt/Ti/SiO2/Si substrates by sol-gel processing using a thin Pb(Zr0.52Ti0.48)O3 seed layer. X-ray diffraction anal. and SEM revealed that the films were strongly (111) oriented, mimicking the orientation of the (111) Pt/Ti/SiO2/Si substrate. No pyrochlore phase was obsd. by x-ray diffraction and the films had a uniform grain size of about 50-60 nm. The dielec. permittivity and loss factor varied only slightly with frequency in the range of 100-10000 Hz. At 1 kHz, the dielec. permittivity was 1025 and dielec. loss was 0.028. The **films** exhibited good **ferroelec.** and piezoelec. properties. The remanent polarization (Pr) was 30 μC/cm2. The effective transverse piezoelec. e31,f coeff. of the films was measured using a modified wafer flexure method.

IT **170965-44-3**, Lead niobium titanium ytterbium oxide (PbNb0.25Ti0.5Yb0.25O3)
RL: PRP (Properties)
(structure and piezoelec. properties of sol-gel-derived 0.5 Pb[Yb1/2Nb1/2]O3-0.5 PbTiO3 thin films (PbYb1/2Nb1/2O3)0.5(PbTiO3)0.5)

RN 170965-44-3 HCAPLUS
CN Lead niobium titanium ytterbium oxide (PbNb0.25Ti0.5Yb0.25O3) (9CI) (CA INDEX NAME)

Component	Ratio	Component Registry Number
O	3	17778-80-2
Yb	0.25	7440-64-4
Ti	0.5	7440-32-6
Nb	0.25	7440-03-1
Pb	1	7439-92-1

CC 76-7 (Electric Phenomena)

IT **170965-44-3**, Lead niobium titanium ytterbium oxide (PbNb0.25Ti0.5Yb0.25O3)
RL: PRP (Properties)
(structure and piezoelec. properties of sol-gel-derived 0.5 Pb[Yb1/2Nb1/2]O3-0.5 PbTiO3 thin films

(PbYb1/2Nb1/2O3)0.5(PbTiO3)0.5)
REFERENCE COUNT: 15 THERE ARE 15 CITED REFERENCES AVAILABLE FOR THIS RECORD. ALL CITATIONS AVAILABLE IN THE RE FORMAT

L11 ANSWER 9 OF 11 HCAPLUS COPYRIGHT 2006 ACS on STN
ACCESSION NUMBER: 2001:420596 HCAPLUS
DOCUMENT NUMBER: 135:130560
TITLE: Fatigue anisotropy in pulsed laser deposited PYbN-PT thin films
AUTHOR(S): Bornand, Veronique; Trolier-McKinstry, Susan
CORPORATE SOURCE: Laboratoire de Physicochimie de la Matiere Condensee, CNRS UMR 5617, Montpellier, 34095, Fr.
SOURCE: Annales de Chimie (Paris, France) (2001), 26(1), 141-144
CODEN: ANCPAC; ISSN: 0151-9107
PUBLISHER: Editions Scientifiques et Medicales Elsevier
DOCUMENT TYPE: Journal
LANGUAGE: English
AB Heterostructures consisting of a (100) LaAlO3 (LAO) or (111) SrTiO3 (STO) substrate, a SrRuO3 (SRO) metallic oxide bottom electrode, and a (1-x)Pb[Yb1/2Nb1/2]O3-x PbTiO3(PYbN-PT, x .apprx. 0.5 or 0.6) **ferroelec.** thin **film** were grown by the pulsed laser deposition process. The films were perovskite structured, with orientations that ranged from highly <001>pc-oriented PYbN-PT/SRO/LAO to highly <111>pc-oriented PYbN-PT/SRO/STO multilayer systems. According to the crystal orientation, the ferroelec. and fatigue characteristics of such as-grown planar capacitors vary significantly. In particular, <001>pc-heteroepitaxial thin films result in fatigue-free capacitors up to 1011 cycles while <111>pc-oriented heterostructures exhibit a marked degrdn. of the switchable polarization by a.c. voltage cycling. These data agree with recent findings of fatigue anisotropy in relaxor ferroelec.-PbTiO3 single crystals. This orientation dependence may result from differences in the domain configuration and switching process.
IT **170965-44-3**, Lead niobium titanium ytterbium oxide (PbNb0.25Ti0.5Yb0.2503) **170965-48-7**, Lead niobium titanium ytterbium oxide (PbNb0.2Ti0.6Yb0.203)
RL: PEP (Physical, engineering or chemical process); PRP (Properties); TEM (Technical or engineered material use); PROC (Process); USES (Uses)
(fatigue anisotropy in pulsed laser deposited lead niobium titanium ytterbium oxide thin films)
RN 170965-44-3 HCAPLUS
CN Lead niobium titanium ytterbium oxide (PbNb0.25Ti0.5Yb0.2503) (9CI) (CA INDEX NAME)

Component	Ratio	Component Registry Number

O	3	17778-80-2
Yb	0.25	7440-64-4
Ti	0.5	7440-32-6
Nb	0.25	7440-03-1
Pb	1	7439-92-1

RN 170965-48-7 HCAPLUS
CN Lead niobium titanium ytterbium oxide (PbNb0.2Ti0.6Yb0.2O3) (9CI) (CA INDEX NAME)

Component	Ratio	Component Registry Number
O	3	17778-80-2
Yb	0.2	7440-64-4
Ti	0.6	7440-32-6
Nb	0.2	7440-03-1
Pb	1	7439-92-1

CC 76-8 (Electric Phenomena)
IT **170965-44-3**, Lead niobium titanium ytterbium oxide (PbNb0.25Ti0.5Yb0.25O3) **170965-48-7**, Lead niobium titanium ytterbium oxide (PbNb0.2Ti0.6Yb0.2O3)
RL: PEP (Physical, engineering or chemical process); PRP (Properties); TEM (Technical or engineered material use); PROC (Process); USES (Uses)
(fatigue anisotropy in pulsed laser deposited lead niobium titanium ytterbium oxide thin films)
REFERENCE COUNT: 11 THERE ARE 11 CITED REFERENCES AVAILABLE FOR THIS RECORD. ALL CITATIONS AVAILABLE IN THE RE FORMAT

L11 ANSWER 10 OF 11 HCAPLUS COPYRIGHT 2006 ACS on STN
ACCESSION NUMBER: 2000:400121 HCAPLUS
DOCUMENT NUMBER: 133:186229
TITLE: Phase development in pulsed laser deposited Pb[Yb0.5Nb0.5]O3-PbTiO3 thin films
AUTHOR(S): Bornand, V.; Trolier-McKinstry, S.
CORPORATE SOURCE: Materials Research Laboratory, Department of Materials Science and Engineering, The Pennsylvania State University, University Park, PA, 16802-4801, USA
SOURCE: Thin Solid Films (2000), 370(1,2), 70-77
CODEN: THSFAP; ISSN: 0040-6090
PUBLISHER: Elsevier Science S.A.
DOCUMENT TYPE: Journal
LANGUAGE: English
AB (1-X)Pb[Yb0.5Nb0.5]O3 - xPbTiO3 (PYbN-PT, x = 0.4 and 0.5)/SrRuO3 (SRO) heterostructures have been prepd. by pulsed laser deposition (PLD) on <100>pc-oriented LaAlO3 (LAO) substrates (the subscript pc refers here to the pseudo-cubic perovskite

subcell). Careful control of both lead volatilization and pyrochlore formation during the growth appears to be essential to obtain perovskite PYbN-PT thin films with good cryst., elec. and ferroelec. properties. By utilizing PbO-enriched ceramic targets and adjusting deposition parameters such as the laser frequency, the chamber pressure, the target to substrate distance and/or the substrate temp., high-quality thin films can be successfully grown with a single out-of-plane <001>pc orientation and an in-plane heteroepitaxial arrangement of [110]pc PYbN-PT // [110]pc. SrRuO3. When processed in the 560 - 660° temp. range, with a dynamic O3/O2 pressure of 300 - 400 mTorr and relatively high laser repetition rates, PYbN-PT **films** exhibit improved **ferroelec.** properties. The typical values of the remanent (Pr) and satn. (Ps) polarizations increase up to 50 and 80 μC/cm2, resp.

IT **170965-40-9**, Lead niobium titanium ytterbium oxide (PbNb0.3Ti0.4Yb0.3O3) **170965-44-3**, Lead niobium titanium ytterbium oxide (PbNb0.25Ti0.5Yb0.25O3)
RL: PEP (Physical, engineering or chemical process); PRP (Properties); PROC (Process)
(ceramic thin film; phase development in pulsed laser deposited)

RN 170965-40-9 HCAPLUS

CN Lead niobium titanium ytterbium oxide (PbNb0.3Ti0.4Yb0.3O3) (9CI) (CA INDEX NAME)

Component	Ratio	Component Registry Number
O	3	17778-80-2
Yb	0.3	7440-64-4
Ti	0.4	7440-32-6
Nb	0.3	7440-03-1
Pb	1	7439-92-1

RN 170965-44-3 HCAPLUS

CN Lead niobium titanium ytterbium oxide (PbNb0.25Ti0.5Yb0.25O3) (9CI) (CA INDEX NAME)

Component	Ratio	Component Registry Number
O	3	17778-80-2
Yb	0.25	7440-64-4
Ti	0.5	7440-32-6
Nb	0.25	7440-03-1
Pb	1	7439-92-1

CC 76-8 (Electric Phenomena)
Section cross-reference(s): 56, 57, 75, 77

IT **Ferroelectric films**
(Pb[Yb0.5Nb0.5]O3-PbTiO3; phase development in pulsed laser deposited)

IT 12034-65-0, Lead niobium ytterbium oxide (PbNb0.5Yb0.5O3)
12060-00-3, Lead titanium oxide (PbTiO3) **170965-40-9**, Lead niobium titanium ytterbium oxide (PbNb0.3Ti0.4Yb0.3O3)
170965-44-3, Lead niobium titanium ytterbium oxide (PbNb0.25Ti0.5Yb0.25O3)
RL: PEP (Physical, engineering or chemical process); PRP (Properties); PROC (Process)
(ceramic thin film; phase development in pulsed laser deposited)
REFERENCE COUNT: 28 THERE ARE 28 CITED REFERENCES AVAILABLE FOR THIS RECORD. ALL CITATIONS AVAILABLE IN THE RE FORMAT

L11 ANSWER 11 OF 11 HCAPLUS COPYRIGHT 2006 ACS on STN
ACCESSION NUMBER: 2000:178150 HCAPLUS
DOCUMENT NUMBER: 132:287188
TITLE: Phase transitions and properties of perovskite **ferroelectric** ceramics and **films** for certain applications
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DOCUMENT TYPE: Journal
LANGUAGE: English
AB The structure-properties relations and phase transitions in perovskite ceramics, and films of PLZT, PLZST, PST, PSN, PMNT compds. are discussed with regard to ordering, relaxor behavior, pronounced ferroelec., electromech. and electrocaloric properties. The theor. approach is extended to the time dependent Ginsburg-Landau model. The evolution of dielec. properties in relaxors after the change of temp. and elec. field creating an increase of dielec. permittivity is found to follow a logarithmic law of decay. A strong electromech. response is obsd. in a no. of thin films of different compns.
IT **263871-47-2**, Lead lutetium niobium titanium oxide (PbLu0-0.5Nb0-0.5Ti0-1O3)
RL: PRP (Properties)
(phase transitions and properties of perovskite **ferroelec** . ceramics and **films** for certain applications)
RN 263871-47-2 HCAPLUS
CN Lead lutetium niobium titanium oxide (PbLu0-0.5Nb0-0.5Ti0-1O3) (9CI) (CA INDEX NAME)

Component	Ratio	Component Registry Number
O	3	17778-80-2
Ti	0 - 1	7440-32-6

Nb	0 - 0.5	7440-03-1
Lu	0 - 0.5	7439-94-3
Pb	1	7439-92-1

CC 76-8 (Electric Phenomena)
Section cross-reference(s): 57

IT Ferroelectric materials
(ceramic; phase transitions and properties of perovskite **ferroelec.** ceramics and **films** for certain applications)

IT Annealing
(effect of; phase transitions and properties of perovskite **ferroelec.** ceramics and **films** for certain applications)

IT Electromechanical effect
Phase diagram
Phase transition
Piezoelectricity
Strain
(phase transitions and properties of perovskite **ferroelec** . ceramics and **films** for certain applications)

IT 114756-07-9, Lanthanum lead titanium zirconium oxide (La0.04Pb0.96Ti0.35Zr0.6503)
RL: PRP (Properties)
(PLZT 4/65/35, PLZT 4.5/65/35; phase transitions and properties of perovskite **ferroelec.** ceramics and **films** for certain applications)

IT 127814-44-2, Lanthanum lead titanium zirconium oxide (La0.05Pb0.95Ti0.35Zr0.6503)
RL: PRP (Properties)
(PLZT 5/65/35; phase transitions and properties of perovskite **ferroelec.** ceramics and **films** for certain applications)

IT 114756-04-6, Lanthanum lead titanium zirconium oxide (La0.06Pb0.94Ti0.35Zr0.6503)
RL: PRP (Properties)
(PLZT 6/65/35, PLZT 6.5/65/35; phase transitions and properties of perovskite **ferroelec.** ceramics and **films** for certain applications)

IT 111592-97-3, Lanthanum lead titanium zirconium oxide (La0.08Pb0.92Ti0.3Zr0.703)
RL: PRP (Properties)
(PLZT 8.3/70/30; phase transitions and properties of perovskite **ferroelec.** ceramics and **films** for certain applications)

IT 115709-79-0, PLZT 10/65/35
RL: PRP (Properties)
(PLZT 9.75/65/35; phase transitions and properties of perovskite **ferroelec.** ceramics and **films** for certain applications)

IT 210289-14-8, Lead magnesium niobium titanium oxide (PbMg0.22Nb0.46Ti0.3203)

RL: PRP (Properties)
(PMNT 68/32; phase transitions and properties of perovskite **ferroelec.** ceramics and **films** for certain applications)

IT 153039-90-8, Lead niobium scandium titanium oxide (PbNb0.29Sc0.29Ti0.42O3)
RL: PRP (Properties)
(PSNT 58/42; phase transitions and properties of perovskite **ferroelec.** ceramics and **films** for certain applications)

IT 12586-31-1, Neutron
RL: NUU (Other use, unclassified); USES (Uses)
(effect of irradn. by; phase transitions and properties of perovskite **ferroelec.** ceramics and **films** for certain applications)

IT 12034-64-9, Lead niobium scandium oxide pbnb0.5sc0.5o3 12036-91-8, Lead scandium tantalum oxide pbsc0.5ta0.5o3 106605-77-0, PZT 65/35 110640-27-2, PLZT 8/65/35 118956-68-6, Lanthanum lead titanate la0.08pb0.88tio3 193402-53-8, Lead niobium tin titanium zirconium oxide pb0.98Nb0.02Sn0.2Ti0.05Zr0.75O3 **263871-47-2**, Lead lutetium niobium titanium oxide (PbLu0-0.5Nb0-0.5Ti0-1O3)
RL: PRP (Properties)
(phase transitions and properties of perovskite **ferroelec** . ceramics and **films** for certain applications)

IT 1309-48-4, Magnesium oxide, uses 7440-06-4, Platinum, uses 7440-21-3, Silicon, uses 13463-67-7, Titania, uses 107539-20-8, Barium copper yttrium oxide 108658-67-9, Copper lanthanum strontium oxide
RL: NUU (Other use, unclassified); USES (Uses)
(substrate; phase transitions and properties of perovskite **ferroelec.** ceramics and **films** for certain applications)

REFERENCE COUNT: 34 THERE ARE 34 CITED REFERENCES AVAILABLE FOR THIS RECORD. ALL CITATIONS AVAILABLE IN THE RE FORMAT

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L20 ANSWER 1 OF 30 HCAPLUS COPYRIGHT 2006 ACS on STN
2005:143608 Document No. 143:357963 Crystal growth of relaxor **ferroelectric** solid solution single crystals near a morphotropic phase boundary with high Curie temperature and some properties. Yasuda, N.; Itoh, Y.; Ohwa, H.; Yamashita, Y.; Iwata, M.; Ishibashi, Y. (Electrical & Electronic Engineering Department, Gifu University, Gifu, 501-1193, Japan). Transactions of the Materials Research Society of Japan, 29(4), 1359-1364 (English) 2004. CODEN: TMRJE3. ISSN: 1382-3469. Publisher: Materials Research Society of Japan.

AB The Pb(In1/2Nb1/2)O3-PbTiO3 [PIN-PT] and Pb(Yb1/2Nb1/2)O3-PbTiO3 [PYN-PT] binary system single crystals near the morphotropic phase boundary [MPB] compn. with pseudo-cubic (100) planes were grown by

the conventional flux method using PbO-PbF2-B2O3 flux. The PIN-PT single crystal near the MPB grown along <110> direction was obtained by the soln. Bridgman method using PbO-B2O3 flux. The PIN single crystals undergo successively a decompn. at 1254°, and a peritectic melting at 1399° upon heating. The PIN-PT(72/28) and PYN-PT(47/53) single crystals show a peritectic m.p. at 1283 and 1205°, resp. with a partial decompn. of the perovskite crystal into pyrochlore one, followed by a liquidus point at 1294 and 1253°, resp. The stability of the perovskite phase, in PIN and PYN-PT crystals is enhanced with solid soln. with PT. The Curie temp. of PIN-PT(72/28) and PYN-PT(47/53) single crystals are 276 and 404°, resp. The electromech. coupling coeff. in rectangular bar mode, k33' = 78%, of PIN-PT(72/28) single crystal for phased array ultrasonic transducers was obtained along <001> axis in the rhombohedral phase, which is independent of temp., and at 200° decreases by 5%.

IT **170965-48-7**, Lead niobium titanium ytterbium oxide (PbNb0.2Ti0.6Yb0.2O3) **380405-46-9**, Lead niobium titanium ytterbium oxide (PbNb0.24Ti0.53Yb0.24O3)
RL: PEP (Physical, engineering or chemical process); PRP (Properties); PYP (Physical process); PROC (Process)
(crystal growth of relaxor **ferroelec.** solid soln. single crystals near morphotropic phase boundary with high Curie temp. and their structural and thermal properties)

RN 170965-48-7 HCAPLUS
CN Lead niobium titanium ytterbium oxide (PbNb0.2Ti0.6Yb0.2O3) (9CI) (CA INDEX NAME)

Component	Ratio	Component Registry Number
O	3	17778-80-2
Yb	0.2	7440-64-4
Ti	0.6	7440-32-6
Nb	0.2	7440-03-1
Pb	1	7439-92-1

RN 380405-46-9 HCAPLUS
CN Lead niobium titanium ytterbium oxide (PbNb0.24Ti0.53Yb0.24O3) (9CI) (CA INDEX NAME)

Component	Ratio	Component Registry Number
O	3	17778-80-2
Yb	0.24	7440-64-4
Ti	0.53	7440-32-6
Nb	0.24	7440-03-1
Pb	1	7439-92-1

CC 76-8 (Electric Phenomena)
ST lead indium niobate titanate relaxor **ferroelec** crystal

growth; ytterbium lead niobate titanate relaxor **ferroelec** crystal growth

IT Bridgman crystal growth
Curie temperature (**ferroelectric**)
Piezoelectricity
Relaxor **ferroelectrics**
Thermal stability
(crystal growth of relaxor **ferroelec.** solid soln. single crystals near morphotropic phase boundary with high Curie temp. and their structural and thermal properties)

IT **170965-48-7**, Lead niobium titanium ytterbium oxide (PbNb0.2Ti0.6Yb0.2O3) 208596-15-0, Indium lead niobium titanium oxide (In0.36PbNb0.36Ti0.28O3) **380405-46-9**, Lead niobium titanium ytterbium oxide (PbNb0.24Ti0.53Yb0.24O3) 503274-45-1, Indium lead niobium titanium oxide (In0.32PbNb0.32Ti0.37O3)
RL: PEP (Physical, engineering or chemical process); PRP (Properties); PYP (Physical process); PROC (Process)
(crystal growth of relaxor **ferroelec.** solid soln. single crystals near morphotropic phase boundary with high Curie temp. and their structural and thermal properties)

L20 ANSWER 2 OF 30 HCAPLUS COPYRIGHT 2006 ACS on STN
2004:345015 Document No. 141:358902 Effect of Zr substitution on structural and dielectric properties of Pb5EuTi3-xZrxNb7O30 (x = 0, 1, 2 and 3) **ferroelectric** ceramics. Singh, Alok K.; Choudhary, R. N. P. (Department of Physics and Meteorology, Indian Institute of Technology, Kharagpur, 721302, India). Journal of Materials Science: Materials in Electronics, 15(6), 379-384 (English) 2004. CODEN: JSMEEV. ISSN: 0957-4522. Publisher: Kluwer Academic Publishers.

AB The polycryst. samples of Pb5EuTi3-xZrxNb7O30 (x = 0, 1, 2 and 3) were prepd. by a high-temp. solid-state reaction technique. Formation of the compds. was checked by X-ray diffraction method. All the compds. were found to have orthorhombic structure at room temp. Studies of their dielec. const. (e) as a function of temp. (25-375 °C) at 10 kHz exhibit **ferroelec.** phase transition of a diffuse-type. With increasing Zr concn. (x), transition temp. (Tc) as well as dielec. const. decreases. Temp. variation of d.c. resistivity/cond. shows that these compds. exhibit neg. temp. coeff. of resistance in the high temp. range.

IT **624715-50-0P**, Europium lead niobium titanium oxide (EuPb5Nb7Ti3O30) **775355-41-4P**, Europium lead niobium zirconium oxide (EuPb5Nb7Zr3O30)
RL: PEP (Physical, engineering or chemical process); PRP (Properties); PYP (Physical process); SPN (Synthetic preparation); PREP (Preparation); PROC (Process)
(effect of Zr substitution on structural and dielec. properties of Pb5EuTi3-xZrxNb7O30 (x = 0, 1, 2 and 3) **ferroelec.** ceramics)

RN 624715-50-0 HCAPLUS
CN Europium lead niobium titanium oxide (EuPb5Nb7Ti3O30) (9CI) (CA INDEX NAME)

Component	Ratio	Component Registry Number
O	30	17778-80-2
Eu	1	7440-53-1
Ti	3	7440-32-6
Nb	7	7440-03-1
Pb	5	7439-92-1

RN 775355-41-4 HCAPLUS
CN Europium lead niobium zirconium oxide (EuPb5Nb7Zr3O30) (9CI) (CA INDEX NAME)

Component	Ratio	Component Registry Number
O	30	17778-80-2
Zr	3	7440-67-7
Eu	1	7440-53-1
Nb	7	7440-03-1
Pb	5	7439-92-1

CC 76-8 (Electric Phenomena)
Section cross-reference(s): 75
ST europium lead titanate zirconate niobate **ferroelec** structure dielec const
IT Calcination
Crystal structure-property relationship
Curie temperature (**ferroelectric**)
Dielectric constant
Dielectric loss
Electric conductivity
Ferroelectric transition
Microstructure
(effect of Zr substitution on structural and dielec. properties of Pb5EuTi3-xZrxNb7O30 (x = 0, 1, 2 and 3) **ferroelec.** ceramics)
IT **624715-50-0P**, Europium lead niobium titanium oxide (EuPb5Nb7Ti3O30) 775355-39-0P 775355-40-3P **775355-41-4P**, Europium lead niobium zirconium oxide (EuPb5Nb7Zr3O30)
RL: PEP (Physical, engineering or chemical process); PRP (Properties); PYP (Physical process); SPN (Synthetic preparation); PREP (Preparation); PROC (Process)
(effect of Zr substitution on structural and dielec. properties of Pb5EuTi3-xZrxNb7O30 (x = 0, 1, 2 and 3) **ferroelec.** ceramics)
IT 1308-96-9, Europium oxide 1313-96-8, Niobium pentoxide 1314-23-4, Zirconia, reactions 1317-36-8, Lead monoxide, reactions 13463-67-7, Titania, reactions
RL: RCT (Reactant); RACT (Reactant or reagent)
(effect of Zr substitution on structural and dielec. properties

of Pb5EuTi3-xZrxNb7O30 (x = 0, 1, 2 and 3) **ferroelec.** ceramics)

L20 ANSWER 3 OF 30 HCAPLUS COPYRIGHT 2006 ACS on STN
2004:248632 Document No. 141:62935 **Ferroelectric** phase transition in Pb3R3Ti5Nb5O30 (R = Eu and Gd) ceramics. Singh, A. K.; Choudhary, R. N. P. (Department of Physics and Meteorology, Indian Institute of Technology, Kharagpur, 721302, India). Journal of Materials Science, 39(8), 2873-2876 (English) 2004. CODEN: JMTSAS. ISSN: 0022-2461. Publisher: Kluwer Academic Publishers.

AB The compds Pb3R3Ti5Nb5O30 (R = Eu and Gd) have an orthorhombic structure at room temp. These compds. show a diffuse-type **ferroelec.** phase transition with a transition temp. well above room temp. The authors also obsd. low activation temp. and decreasing resistance with rise in temp., which indicates the intrinsic semiconductor character of the materials.

IT **705942-12-7**, Europium lead niobium titanium oxide (Eu3Pb3Nb5Ti5O30) **705942-19-4**, Gadolinium lead niobium titanium oxide (Gd3Pb3Nb5Ti5O30)
RL: PEP (Physical, engineering or chemical process); PYP (Physical process); PROC (Process)
(**ferroelec.** phase transition in Pb3R3Ti5Nb5O30 (R = Eu and Gd) ceramics)

RN 705942-12-7 HCAPLUS
CN Europium lead niobium titanium oxide (Eu3Pb3Nb5Ti5O30) (9CI) (CA INDEX NAME)

Component	Ratio	Component Registry Number
O	30	17778-80-2
Eu	3	7440-53-1
Ti	5	7440-32-6
Nb	5	7440-03-1
Pb	3	7439-92-1

RN 705942-19-4 HCAPLUS
CN Gadolinium lead niobium titanium oxide (Gd3Pb3Nb5Ti5O30) (9CI) (CA INDEX NAME)

Component	Ratio	Component Registry Number
O	30	17778-80-2
Gd	3	7440-54-2
Ti	5	7440-32-6
Nb	5	7440-03-1
Pb	3	7439-92-1

CC 76-8 (Electric Phenomena)
ST **ferroelec** phase transition lead europium titanate niobate ceramics; gadolinium lead titanate niobate ceramics

ferroelec phase transition

IT **Ferroelectric** materials
(ceramic; **ferroelec.** phase transition in Pb3R3Ti5Nb5O30 (R = Eu and Gd) ceramics)

IT **Ferroelectric** transition
(**ferroelec.** phase transition in Pb3R3Ti5Nb5O30 (R = Eu and Gd) ceramics)

IT **705942-12-7**, Europium lead niobium titanium oxide (Eu3Pb3Nb5Ti5O30) **705942-19-4**, Gadolinium lead niobium titanium oxide (Gd3Pb3Nb5Ti5O30)
RL: PEP (Physical, engineering or chemical process); PYP (Physical process); PROC (Process)
(**ferroelec.** phase transition in Pb3R3Ti5Nb5O30 (R = Eu and Gd) ceramics)

L20 ANSWER 4 OF 30 HCAPLUS COPYRIGHT 2006 ACS on STN

2004:109640 Document No. 141:182791 Characterization of high Curie temperature piezocrystals in doped Pb(Yb1/2Nb1/2)O3-PbTiO3 system. Zhang, Shujun; Randall, Clive A.; Shrout, Thomas R. (Material Research Institute, Pennsylvania State University, University Park, PA, 16802, USA). Ceramic Transactions, 150(Ceramic Materials and Multilayer Electronic Devices), 149-156 (English) 2004. CODEN: CETREW. ISSN: 1042-1122. Publisher: American Ceramic Society.

AB The industrial and scientific communities have expressed a real need for the capability of actuators and transducers at elevated temps. Pb(Zn1/3Nb2/3)O3-PbTiO3 (PZNT) and Pb(Mg1/3Nb2/3)O3-PbTiO3 (PMNT) single crystals attracted many attentions in the last 2 decades because of their ultrahigh piezoelec. and electromech. properties compared to com. Pb(ZrxTi1-x)O3 (PZT) ceramic, but the applications were limited owing to their low Curie temp. (Tc). Attempts to grow high Tc piezoelec. single crystals in the Pb(Yb1/2Nb1/2)O3-PbTiO3 (PYNT) systems were explored. The Zn-doped PYNT single crystals possess similar Tc (≈325°) but much higher rhombohedral to tetragonal phase transition temp. (Tr-t) (≈212°) compared to the Ba-doped one (≈160°). The detailed dielec. and piezoelec. properties were reported for Zn-doped PYNT single crystals and compared to the Ba-doped PYNT in this paper.

IT **170965-41-0**, Lead niobium titanium ytterbium oxide (PbNb0.28Ti0.45Yb0.28O3)
RL: PEP (Physical, engineering or chemical process); PRP (Properties); PYP (Physical process); PROC (Process)
(characterization of high Curie temp. piezocrystals in Ba- and Zn-doped Pb(Yb1/2Nb1/2)O3-PbTiO3 system)

RN 170965-41-0 HCAPLUS

CN Lead niobium titanium ytterbium oxide (PbNb0.28Ti0.45Yb0.28O3) (9CI) (CA INDEX NAME)

Component	Ratio	Component Registry Number
O	3	17778-80-2

Yb	0.28	7440-64-4
Ti	0.45	7440-32-6
Nb	0.28	7440-03-1
Pb	1	7439-92-1

CC 76-7 (Electric Phenomena)
ST zinc doped lead ytterbium niobate titanate **ferroelec** Curie temp
IT Curie temperature (**ferroelectric**)
Dielectric constant
Piezoelectric materials
(characterization of high Curie temp. piezocrystals in Ba- and Zn-doped Pb(Yb1/2Nb1/2)O3-PbTiO3 system)
IT **170965-41-0**, Lead niobium titanium ytterbium oxide (PbNb0.28Ti0.45Yb0.28O3)
RL: PEP (Physical, engineering or chemical process); PRP (Properties); PYP (Physical process); PROC (Process)
(characterization of high Curie temp. piezocrystals in Ba- and Zn-doped Pb(Yb1/2Nb1/2)O3-PbTiO3 system)

L20 ANSWER 5 OF 30 HCAPLUS COPYRIGHT 2006 ACS on STN
2003:675334 Document No. 140:330372 High Curie temperature, high performance perovskite single crystals in the Pb(Yb1/2Nb1/2)O3-PbTiO3 and BiScO3-PbTiO3 systems. Zhang, Shujun; Lebrun, Laurent; Randall, Clive A.; Shrout, Thomas R. (Material Research Institute, Pennsylvania State University, University Park, PA, 16802, USA). Ceramic Transactions, 136(Morphotropic Phase Boundary Pervskites, High Strain Piezoelectrics, and Dielectric Ceramics), 85-93 (English) 2003. CODEN: CETREW. ISSN: 1042-1122. Publisher: American Ceramic Society.
AB Pb(Zn1/3Nb2/3)O3-PbTiO3 (PZNT) and Pb(Mg1/3Nb2/3)O3-PbTiO3 (PMNT) single crystals are promising candidates for transducers and actuators owing to their high piezoelec. properties. However, their implementation is greatly limited by their low Curie temp. (Tc ≈ 150-170°), which are further limited by **ferroelec.** phase transition temp. (Tr-t ≈ 80-120°). Attempts to grow crystals of high Tc piezoelec. in the Pb(Yb1/2Nb1/2)O3PbTiO3 (PYNT) and BiScO3-PbTiO3 (BSPT) systems were explored. The Tc of the PYNT near the morphotropic phase boundary (MPB) compn. was found to be ≈350°, with properties comparable to PZNT and PMNT single crystals. He Tc of tetragonal BSPT single crystals near the MPB was ≈460° with a thickness mode electromech. coupling factor kt of 60-64%. The coercive fields of both crystals are significantly larger than PZNT and PMNT single crystals, reflecting better domain stability.
IT **170965-40-9**, Lead niobium titanium ytterbium oxide (PbNb0.3Ti0.4Yb0.3O3) **170965-41-0**, Lead niobium titanium ytterbium oxide (PbNb0.28Ti0.45Yb0.28O3)
RL: PEP (Physical, engineering or chemical process); PRP (Properties); PYP (Physical process); PROC (Process)
(high Curie temp., high performance perovskite single crystals in

Pb(Yb1/2Nb1/2)O3-PbTiO3 and BiScO3-PbTiO3 systems)

RN 170965-40-9 HCAPLUS

CN Lead niobium titanium ytterbium oxide (PbNb0.3Ti0.4Yb0.3O3) (9CI) (CA INDEX NAME)

Component	Ratio	Component Registry Number
O	3	17778-80-2
Yb	0.3	7440-64-4
Ti	0.4	7440-32-6
Nb	0.3	7440-03-1
Pb	1	7439-92-1

RN 170965-41-0 HCAPLUS

CN Lead niobium titanium ytterbium oxide (PbNb0.28Ti0.45Yb0.28O3) (9CI) (CA INDEX NAME)

Component	Ratio	Component Registry Number
O	3	17778-80-2
Yb	0.28	7440-64-4
Ti	0.45	7440-32-6
Nb	0.28	7440-03-1
Pb	1	7439-92-1

CC 76-8 (Electric Phenomena)

ST lead ytterbium niobate titanate dielec piezoelec **ferroelec** property; bismuth scandium lead titanate dielec piezoelec **ferroelec** property

IT Dielectric constant
Dielectric loss
Ferroelectricity
Piezoelectricity
(of high Curie temp., high performance perovskite single crystals in Pb(Yb1/2Nb1/2)O3-PbTiO3 and BiScO3-PbTiO3 systems)

IT **170965-40-9**, Lead niobium titanium ytterbium oxide (PbNb0.3Ti0.4Yb0.3O3) **170965-41-0**, Lead niobium titanium ytterbium oxide (PbNb0.28Ti0.45Yb0.28O3) 677768-07-9, Bismuth lead scandium titanium oxide
RL: PEP (Physical, engineering or chemical process); PRP (Properties); PYP (Physical process); PROC (Process)
(high Curie temp., high performance perovskite single crystals in Pb(Yb1/2Nb1/2)O3-PbTiO3 and BiScO3-PbTiO3 systems)

L20 ANSWER 6 OF 30 HCAPLUS COPYRIGHT 2006 ACS on STN

2003:639781 Document No. 139:253499 Dielectric relaxation in the Pb(Yb1/2Nb1/2)O3-PbTiO3 solid solution single crystal near the morphotropic phase boundary. Yasuda, Naohiko; Inaba, Hiroaki; Ohwa, Hidehiro; Iwata, Makoto; Terauchi, Hikaru; Ishibashi, Yoshihiro (Electrical and Electronic Engineering Department, Gifu University,

501-1193, Japan). Applied Physics Letters, 83(7), 1409-1410 (English) 2003. CODEN: APPLAB. ISSN: 0003-6951. Publisher: American Institute of Physics.

AB The dielec. properties in 0.47Pb(Yb1/2Nb1/2)O3-0.53PbTiO3 (0.47PYN-0.53PT) single crystals near the morphotropic phase boundary (MPB) were investigated in the frequency range from 10 kHz to 1 MHz. Remarkable dielec. relaxation was obsd. along the polar <001> direction in the tetragonal 0.47PYN-0.53PT single crystal near the MPB. An increase of the dielec. relaxation time was obsd. as the Curie temp. was approached. The real part and the imaginary part of the complex relative permittivity obeys the Cole-Cole arc law, and the Debye type dielec. dispersion with the polydispersive type among the order-disorder type **ferroelecs** . was obsd.

IT **380405-46-9**, Lead niobium titanium ytterbium oxide (PbNb0.24Ti0.53Yb0.24O3)
RL: PRP (Properties); TEM (Technical or engineered material use); USES (Uses)
(relaxor **ferroelec.**; dielec. relaxation in Pb(Yb1/2Nb1/2)O3-PbTiO3 solid soln. single crystal near morphotropic phase boundary)

RN 380405-46-9 HCAPLUS

CN Lead niobium titanium ytterbium oxide (PbNb0.24Ti0.53Yb0.24O3) (9CI) (CA INDEX NAME)

Component	Ratio	Component Registry Number
O	3	17778-80-2
Yb	0.24	7440-64-4
Ti	0.53	7440-32-6
Nb	0.24	7440-03-1
Pb	1	7439-92-1

CC 76-9 (Electric Phenomena)

ST dielec relaxation lead ytterbium niobate titanate single crystal **ferroelec**

IT Relaxor **ferroelectrics**
(lead ytterbium niobate titanate; dielec. relaxation in Pb(Yb1/2Nb1/2)O3-PbTiO3 solid soln. single crystal near morphotropic phase boundary)

IT **380405-46-9**, Lead niobium titanium ytterbium oxide (PbNb0.24Ti0.53Yb0.24O3)
RL: PRP (Properties); TEM (Technical or engineered material use); USES (Uses)
(relaxor **ferroelec.**; dielec. relaxation in Pb(Yb1/2Nb1/2)O3-PbTiO3 solid soln. single crystal near morphotropic phase boundary)

L20 ANSWER 7 OF 30 HCAPLUS COPYRIGHT 2006 ACS on STN

2003:600845 Document No. 139:389437 Diffuse **ferroelectrics** phase transition in Pb5RTi3Nb7O30 (R=Eu and Gd). Singh, Alok K.;

Choudhary, R. N. P. (Department of Physics and Meteorology, Indian Institute of Technology, Kharagpur, 721302, India). Materials Letters, 57(24-25), 3722-3728 (English) 2003 CODEN: MLETDJ. ISSN: 0167-577X. Publisher: Elsevier Science B.V.

AB The polycryst. complex tungsten-bronze (TB)-type compds. Pb5RTi3Nb7O30 (R = Eu and Gd) were prepd. by a high-temp. solid-state technique. XRD study confirmed the formation of single-phase compds. in an orthorhombic structure at room temp. Detailed studies of dielec. const. (ε) and tangent loss (tanδ) of the above compds. as a function of temp. (room temp. (30°) to 350°) at 10 kHz exhibit a **ferroelec** . phase transition of diffuse type. Temp. variation of resistivity shows that these compds. have neg. temp. coeff. of resistance (NTCR) at high temp.

IT **624715-50-0**, Europium lead niobium titanium oxide (EuPb5Nb7Ti3O30) **624715-51-1**, Gadolinium lead niobium titanium oxide (GdPb5Nb7Ti3O30)
RL: PRP (Properties)
(diffuse **ferroelecs.** phase transition in Pb5EuTi3Nb7O30 and Pb5GdTi3Nb7O30)

RN 624715-50-0 HCAPLUS

CN Europium lead niobium titanium oxide (EuPb5Nb7Ti3O30) (9CI) (CA INDEX NAME)

Component	Ratio	Component Registry Number
O	30	17778-80-2
Eu	1	7440-53-1
Ti	3	7440-32-6
Nb	7	7440-03-1
Pb	5	7439-92-1

RN 624715-51-1 HCAPLUS

CN Gadolinium lead niobium titanium oxide (GdPb5Nb7Ti3O30) (9CI) (CA INDEX NAME)

Component	Ratio	Component Registry Number
O	30	17778-80-2
Gd	1	7440-54-2
Ti	3	7440-32-6
Nb	7	7440-03-1
Pb	5	7439-92-1

CC 76-8 (Electric Phenomena)

ST lear europium gadolinium titanate niobate tungsten bronze **ferroelec** transition

IT Dielectric constant
Dielectric loss
Electric conductivity

Electric resistance
Ferroelectric transition
Molar volume
Phase transition
X-ray diffraction
(diffuse **ferroelecs.** phase transition in Pb5EuTi3Nb7O30 and Pb5GdTi3Nb7O30)

IT **624715-50-0**, Europium lead niobium titanium oxide (EuPb5Nb7Ti3O30) **624715-51-1**, Gadolinium lead niobium titanium oxide (GdPb5Nb7Ti3O30)
RL: PRP (Properties)
(diffuse **ferroelecs.** phase transition in Pb5EuTi3Nb7O30 and Pb5GdTi3Nb7O30)

L20 ANSWER 8 OF 30 HCAPLUS COPYRIGHT 2006 ACS on STN
2003:553218 Document No. 140:208405 Origin of polar domains in **ferroelectric** relaxor of perovskite oxides. Ahn, Sang-Jin; Kim, Jong-Jean; Kim, Jai-Hyun; Choo, Woong-Kil (Physics Department, Korea Advanced Institute of Science and Technology, Daejon, 305-701, S. Korea). Journal of the Korean Physical Society, 42(Suppl. Issue, Proceedings of the 4th Japan-Korea Conference of Ferroelectrics, 2002), S1009-S1011 (English) 2003. CODEN: JKPSDV. ISSN: 0374-4884. Publisher: Korean Physical Society.

AB **Ferroelec.** relaxor has very interesting dielec. and electromech. properties of useful applications, where polar nanodomains play a crucial role. However, the origins of the nano polar domain formations in the cubic perovskite structures are not fully understood although a spin glass analog model and an extended random field model are in partial success. From the authors' exptl. data of electron diffraction and Raman scattering with a **ferroelec.** relaxor the **ferroelec.** relaxor has a localized flexoelectricity. The authors will then propose this flexoelectricity may be the origin of the polar nanodomains in the **ferroelec.** relaxors of cubic symmetry.

IT **170965-35-2**, Lead niobium titanium ytterbium oxide (PbNb0.45Ti0.1Yb0.45O3) **170965-38-5**, Lead niobium titanium ytterbium oxide (PbNb0.4Ti0.2Yb0.4O3)
RL: PEP (Physical, engineering or chemical process); PRP (Properties); PYP (Physical process); PROC (Process)
(model for origin of polar domains in **ferroelec.** relaxor of perovskite oxides)

RN 170965-35-2 HCAPLUS
CN Lead niobium titanium ytterbium oxide (PbNb0.45Ti0.1Yb0.45O3) (9CI) (CA INDEX NAME)

Component	Ratio	Component Registry Number
O	3	17778-80-2
Yb	0.45	7440-64-4
Ti	0.1	7440-32-6
Nb	0.45	7440-03-1

Pb	1	7439-92-1

RN 170965-38-5 HCAPLUS
CN Lead niobium titanium ytterbium oxide (PbNb0.4Ti0.2Yb0.4O3) (9CI) (CA INDEX NAME)

Component	Ratio	Component Registry Number
O	3	17778-80-2
Yb	0.4	7440-64-4
Ti	0.2	7440-32-6
Nb	0.4	7440-03-1
Pb	1	7439-92-1

CC 76-8 (Electric Phenomena)
Section cross-reference(s): 57, 75
ST **ferroelec** domain relaxor perovskite oxide model
IT **Ferroelectric** materials
(Perovskite-type crystals; model for origin of polar domains in **ferroelec.** relaxor of perovskite oxides)
IT Perovskite-type crystals
(**ferroelec.**; model for origin of polar domains in **ferroelec.** relaxor of perovskite oxides)
IT Electron diffraction
Ferroelectric domain
Flexoelectricity
Raman spectra
Relaxor **ferroelectrics**
Simulation and Modeling
(model for origin of polar domains in **ferroelec.** relaxor of perovskite oxides)
IT Oxides (inorganic), properties
RL: PEP (Physical, engineering or chemical process); PRP (Properties); PYP (Physical process); PROC (Process)
(model for origin of polar domains in **ferroelec.** relaxor of perovskite oxides)
IT **170965-35-2**, Lead niobium titanium ytterbium oxide (PbNb0.45Ti0.1Yb0.4503) **170965-38-5**, Lead niobium titanium ytterbium oxide (PbNb0.4Ti0.2Yb0.4O3)
RL: PEP (Physical, engineering or chemical process); PRP (Properties); PYP (Physical process); PROC (Process)
(model for origin of polar domains in **ferroelec.** relaxor of perovskite oxides)

L20 ANSWER 9 OF 30 HCAPLUS COPYRIGHT 2006 ACS on STN
2003:466044 Document No. 139:156631 Brillouin scattering study on polycrystalline relaxor **ferroelectrics.** Ko, Jae-Hyeon; Kim, Do Han; Kojima, Seiji; Kim, Jai-Hyun; Choo, Woong Kil (Institute of Materials Science, University of Tsukuba, Ibaraki, 305-8573, Japan). Japanese Journal of Applied Physics, Part 1: Regular Papers, Short Notes & Review Papers, 42(5B), 3076-3079

(English) 2003. CODEN: JAPNDE. Publisher: Japan Society of Applied Physics.

AB Brillouin spectra of Pb(Yb1/2Nb1/2)O3 (PYN)-based relaxor **ferroelec.** ceramics were measured using a conventional tandem Fabry-Perot interferometer. The measured spectra were composed of a strong elastic peak and a broad doublet with a sharp cutoff at the high-frequency side. The broad doublet was attributed to the distributed Brillouin shift of the longitudinal acoustic mode owing to the scattering events at all scattering angles 0-180° which is due to multiple reflections and refractions. From the sharp high-frequency cutoff of this band, which corresponds to the largest Brillouin shift of the backward scattering geometry, the av. longitudinal sound velocities are 4.22-4.33 km/s for PYN-based relaxor ceramics. Brillouin spectroscopy can be used to derive elastic properties of single crystals and ceramic samples in the GHz range, which will be important for high-frequency applications.

IT **250679-55-1**, Lead niobium ytterbium zirconium oxide (PbNb0.34Yb0.34Zr0.33O3)
RL: PRP (Properties)
(Brillouin effect on polycryst. relaxor **ferroelec.**)

RN 250679-55-1 HCAPLUS

CN Lead niobium ytterbium zirconium oxide (PbNb0.34Yb0.34Zr0.33O3) (9CI) (CA INDEX NAME)

Component	Ratio	Component Registry Number
O	3	17778-80-2
Zr	0.33	7440-67-7
Yb	0.34	7440-64-4
Nb	0.34	7440-03-1
Pb	1	7439-92-1

CC 73-2 (Optical, Electron, and Mass Spectroscopy and Other Related Properties)
Section cross-reference(s): 57, 76

ST lead niobate ytterbate polycryst relaxor **ferroelec** ceramic Brillouin; niobium ytterbium lead oxide polycryst relaxor **ferroelec** ceramic Brillouin

IT Relaxor **ferroelectrics**
(Brillouin effect on lead niobate ytterbate polycryst.)

IT **Ferroelectric** apparatus
(ceramic; Brillouin effect on lead niobate ytterbate polycryst. relaxor)

IT Brillouin effect
(on lead niobate ytterbate polycryst. relaxor **ferroelecs**.)

IT 12034-65-0, Lead niobium ytterbium oxide (PbNb0.5Yb0.5O3) 140906-05-4, Barium lead niobium ytterbium oxide (Ba0.14Pb0.86Nb0.5Yb0.5O3) **250679-55-1**, Lead niobium ytterbium zirconium oxide (PbNb0.34Yb0.34Zr0.33O3)

RL: PRP (Properties)
(Brillouin effect on polycryst. relaxor **ferroelec.**)

L20 ANSWER 10 OF 30 HCAPLUS COPYRIGHT 2006 ACS on STN
2003:423551 Document No. 140:295512 Processing and Electrical Properties of 0.5Pb(Yb1/2Nb1/2)O3-0.5PbTiO3 Ceramics. Duran, Cihangir; Trolier-McKinstry, Susan; Messing, Gary L. (Department of Materials Science and Engineering, Materials Research Institute, The Pennsylvania State University, University Park, PA, 16802, USA). Journal of Electroceramics, 10(1), 47-55 (English) 2003. CODEN: JOELFJ. ISSN: 1385-3449. Publisher: Kluwer Academic Publishers.

AB Pb(Yb1/2Nb1/2)O3-PbTiO3 ceramics at the morphotropic phase boundary (50:50) were sintered by conventional and reactive methods to ≥95% theor. d. and grain sizes <10 μm. Excess PbO, added to enhance the densification, resulted in PbO-based nonferroelec. phases that degraded the elec. properties. Volatilization of excess PbO by annealing the samples after sintering resulted in dense, perovskite samples and excellent elec. properties. The best elec. properties, obtained via reactive sintering, were a remanent polarization, Pr, of 0.36 C/m2, a max. dielec. const. of 31,000 (at the Tc = 371° and 1 kHz), a piezoelec. charge coeff., d33, of 508 pC/N, and an electromech. coupling coeff., k33, of 0.61.

IT **170965-44-3P**, Lead niobium titanium ytterbium oxide (PbNb0.25Ti0.5Yb0.25O3)
RL: PRP (Properties); SPN (Synthetic preparation); TEM (Technical or engineered material use); PREP (Preparation); USES (Uses)
(sintering and properties of)
RN 170965-44-3 HCAPLUS
CN Lead niobium titanium ytterbium oxide (PbNb0.25Ti0.5Yb0.25O3) (9CI) (CA INDEX NAME)

Component	Ratio	Component Registry Number
O	3	17778-80-2
Yb	0.25	7440-64-4
Ti	0.5	7440-32-6
Nb	0.25	7440-03-1
Pb	1	7439-92-1

CC 76-8 (Electric Phenomena)
Section cross-reference(s): 57
ST lead niobate titanate ytterbate sintering **ferroelectricity** dielec microstructure
IT **Ferroelectric** materials
(Perovskite-type crystals; of lead niobium titanium ytterbium oxide)
IT **Ferroelectricity**
(coercive field; of lead niobium titanium ytterbium oxide)
IT Perovskite-type crystals
(**ferroelec.**; of lead niobium titanium ytterbium oxide)
IT Annealing

Curie temperature (**ferroelectric**)
Densification
Dielectric constant
Dielectric hysteresis
Dielectric loss
Grain size
Phase composition
Piezoelectricity
Sintering
(of lead niobium titanium ytterbium oxide)

IT **Ferroelectricity**
(remanent polarization; of lead niobium titanium ytterbium oxide)

IT **170965-44-3P**, Lead niobium titanium ytterbium oxide (PbNb0.25Ti0.5Yb0.25O3)
RL: PRP (Properties); SPN (Synthetic preparation); TEM (Technical or engineered material use); PREP (Preparation); USES (Uses)
(sintering and properties of)

L20 ANSWER 11 OF 30 HCAPLUS COPYRIGHT 2006 ACS on STN
2003:193222 Document No. 138:361062 Some new ceramics and thin films of Pb(B3+,Nb)TiO3-PbTiO3 system. Shebanovs, Leonids; Sternberg, Andris; Zauls, Vismants; Krumins, Andris (Institute of Solid State Physics, University of Latvia, Riga, LV-1063, Latvia). Ferroelectrics, 267, 271-276 (English) 2002. CODEN: FEROA8. ISSN: 0015-0193. Publisher: Taylor & Francis Ltd..

AB The structure, dielec., and electromech. properties of (1-x)Pb(B3+,Nb)TiO3-xPbTiO3 binary systems (B = Lu, Er, Tm, Ho) are reported. High values of the electromech. coupling coeffs. kp = 0.66, kt = 0.48, k31 = 0.36 are attained in lead lutetium niobate titanate (PLuNT) near the morphotropic phase boundary (MPB) between the tetragonal P4mm and pseudomonoclinic phases at x = 0.41. The crystallog. features at the MPB are discussed with respect to electromech. properties. The heterovalent substitution of Pb2+ by La3+ either in both components or maintaining the PbTiO3 unmodified shifts the MPB to the pseudomonoclinic M side of the phase diagram. The initial unmodified material "softens" - the coercive field Ec decreases up to 15.9 kV/cm in the first case and below 10 kV/cm in the second case; simultaneously, high values of max. polarization Pm = 50.3 μC/cm2 and remnant polarization Pr 40.3 μC/cm2 are characteristic. The films of PLuNT with compn. near the MPB formed by in-situ pulsed laser deposition onto LSCO/(100)MgO exhibited **ferroelec.** behavior with Pm 29 μC/cm2, Pr 14 μC/cm2, Ec 70 kV/cm. The zero-field dielec. permittivity ε = 300-450 at room temp., and demonstrates a relaxor-type broad peak around 350°.

IT **519045-66-0**, Erbium lead niobium titanium oxide (Er0.5PbNb0.5TiO3) **519045-67-1**, Lead lutetium niobium titanium oxide (PbLu0.5Nb0.5TiO3) **519045-68-2**, Lead niobium thulium titanium oxide (PbNb0.5Tm0.5TiO3) **519045-69-3**, Holmium lead niobium titanium oxide (Ho0.5PbNb0.5TiO3)
RL: PRP (Properties)

(structure, dielec., and electromech. properties of (1-x)Pb(B3+,Nb)TiO3-xPbTiO3 binary ceramic systems)

RN 519045-66-0 HCAPLUS
CN Erbium lead niobium titanium oxide (Er0.5PbNb0.5TiO3) (9CI) (CA INDEX NAME)

Component	Ratio	Component Registry Number
O	3	17778-80-2
Er	0.5	7440-52-0
Ti	1	7440-32-6
Nb	0.5	7440-03-1
Pb	1	7439-92-1

RN 519045-67-1 HCAPLUS
CN Lead lutetium niobium titanium oxide (PbLu0.5Nb0.5TiO3) (9CI) (CA INDEX NAME)

Component	Ratio	Component Registry Number
O	3	17778-80-2
Ti	1	7440-32-6
Nb	0.5	7440-03-1
Lu	0.5	7439-94-3
Pb	1	7439-92-1

RN 519045-68-2 HCAPLUS
CN Lead niobium thulium titanium oxide (PbNb0.5Tm0.5TiO3) (9CI) (CA INDEX NAME)

Component	Ratio	Component Registry Number
O	3	17778-80-2
Ti	1	7440-32-6
Tm	0.5	7440-30-4
Nb	0.5	7440-03-1
Pb	1	7439-92-1

RN 519045-69-3 HCAPLUS
CN Holmium lead niobium titanium oxide (Ho0.5PbNb0.5TiO3) (9CI) (CA INDEX NAME)

Component	Ratio	Component Registry Number
O	3	17778-80-2
Ho	0.5	7440-60-0
Ti	1	7440-32-6
Nb	0.5	7440-03-1

Pb | 1 | 7439-92-1

CC 76-8 (Electric Phenomena)
ST **ferroelec** ceramics lead rare earth niobate titanate
IT **Ferroelectric** materials
(ceramic; structure, dielec., and electromech. properties of (1-x)Pb(B3+,Nb)TiO3-xPbTiO3 binary ceramic systems)
IT **Ferroelectricity**
(coercive field; structure, dielec., and electromech. properties of (1-x)Pb(B3+,Nb)TiO3-xPbTiO3 binary ceramic systems)
IT 12060-00-3, Lead titanate **519045-66-0**, Erbium lead niobium titanium oxide (Er0.5PbNb0.5TiO3) **519045-67-1**, Lead lutetium niobium titanium oxide (PbLu0.5Nb0.5TiO3) **519045-68-2**, Lead niobium thulium titanium oxide (PbNb0.5Tm0.5TiO3) **519045-69-3**, Holmium lead niobium titanium oxide (Ho0.5PbNb0.5TiO3)
RL: PRP (Properties)
(structure, dielec., and electromech. properties of (1-x)Pb(B3+,Nb)TiO3-xPbTiO3 binary ceramic systems)

L20 ANSWER 12 OF 30 HCAPLUS COPYRIGHT 2006 ACS on STN
2002:949565 Document No. 138:410277 Phase Development and Electrical Properties of Pb(Yb1/2Nb1/2)O3-PbTiO3 Epitaxial Films. Yoshimura, Takeshi; Trolier-McKinstry, Susan (Materials Research Institute, The Pennsylvania State University, University Park, PA, 16802, USA). Integrated Ferroelectrics, 50, 33-42 (English) 2002. CODEN: IFEREU. ISSN: 1058-4587. Publisher: Taylor & Francis Inc..
AB The growth and elec. properties of Pb(Yb1/2Nb1/2)O3-PbTiO3 (PYbN-PT) epitaxial films were investigated. PYbN-PT epitaxial films with SrRuO3 bottom electrodes were grown by pulsed laser deposition. Optimization of the growth conditions for the PYbN-PT epitaxial films was carried out on (100) SrRuO3/(100) LaAlO3 substrates using the (50/50) compn. target. It was found that formation of pyrochlore phase could be caused not only by low growth temps. or lead deficiency, but also by poor surface condition of the SrRuO3 bottom electrodes. (001) PYbN-PT epitaxial films with good cryst. quality were obtained for a range of deposition rates (60-100 nm/min) and temps. (620-680 °C) after vacuum annealing the SrRuO3 bottom electrodes. The **ferroelec.** and piezoelec. properties of 1 μm-thick PYbN-PT epitaxial films with (50/50) and (60/40) compns. and with (001) and (111) orientations were investigated using (100) LaAlO3, (100) SrTiO3, and (111) SrTiO3 substrates with SrRuO3 bottom electrodes. The highest remanent polarization (29 μC/cm2) and effective piezoelec. coeff. e31.f (-14 C/m2) were obsd. in the (001) PYbN-PT (50/50) film. The transition temp. of the (001) PYbN-PT (50/50) film was about 380 °C. Because of the degrdn. of the target during the deposition, a 3 μm-thick film was prepd. by three depositions (1 μm each layer). The 3 μm-thick film exhibited a higher e31.f coeff. of -19 C/m2.
IT **170965-40-9**, Lead niobium titanium ytterbium oxide (PbNb0.3Ti0.4Yb0.3O3) **170965-44-3**, Lead niobium titanium

ytterbium oxide (PbNb0.25Ti0.5Yb0.25O3)
RL: PEP (Physical, engineering or chemical process); PRP (Properties); PYP (Physical process); PROC (Process)
(phase development and elec. properties of Pb(Yb1/2Nb1/2)O3-PbTiO3 epitaxial films)

RN 170965-40-9 HCAPLUS
CN Lead niobium titanium ytterbium oxide (PbNb0.3Ti0.4Yb0.3O3) (9CI) (CA INDEX NAME)

Component	Ratio	Component Registry Number
O	3	17778-80-2
Yb	0.3	7440-64-4
Ti	0.4	7440-32-6
Nb	0.3	7440-03-1
Pb	1	7439-92-1

RN 170965-44-3 HCAPLUS
CN Lead niobium titanium ytterbium oxide (PbNb0.25Ti0.5Yb0.25O3) (9CI) (CA INDEX NAME)

Component	Ratio	Component Registry Number
O	3	17778-80-2
Yb	0.25	7440-64-4
Ti	0.5	7440-32-6
Nb	0.25	7440-03-1
Pb	1	7439-92-1

CC 76-8 (Electric Phenomena)
ST **ferroelec** transition elec property lead ytterbium niobate titanate
IT Annealing
Crystal growth
Crystallinity
Dielectric constant
Dielectric hysteresis
Dielectric loss
Electrodes
Epitaxial films
Ferroelectric transition
Piezoelectricity
(phase development and elec. properties of Pb(Yb1/2Nb1/2)O3-PbTiO3 epitaxial films)
IT **Ferroelectricity**
(remanent polarization; phase development and elec. properties of Pb(Yb1/2Nb1/2)O3-PbTiO3 epitaxial films)
IT **170965-40-9**, Lead niobium titanium ytterbium oxide (PbNb0.3Ti0.4Yb0.3O3) **170965-44-3**, Lead niobium titanium ytterbium oxide (PbNb0.25Ti0.5Yb0.25O3)

RL: PEP (Physical, engineering or chemical process); PRP (Properties); PYP (Physical process); PROC (Process)
(phase development and elec. properties of Pb(Yb1/2Nb1/2)O3-PbTiO3 epitaxial films)

L20 ANSWER 13 OF 30 HCAPLUS COPYRIGHT 2006 ACS on STN
2001:820084 Document No. 136:89442 Features of phase diagrams of binary Pb(B1/2Nb1/2)O3-PbTiO3 systems in vicinity of morphotropic phase boundaries. Sternberg, A.; Shebanovs, L.; Antonova, M.; Livinsh, M. (Institute of Solid State Physics, University of Latvia, Riga, LV-1063, Latvia). Key Engineering Materials, 206-213(Pt. 2, Euro Ceramics VII), 1277-1280 (English) 2002. CODEN: KEMAEY. ISSN: 1013-9826. Publisher: Trans Tech Publications Ltd..

AB Due to multifunctionality binary Pb(B1/2Nb1/2)O3-PbTiO3 systems are attractive to solid state chem. and physics as promising materials for active elements in different electronic devices and microactuators. To study La doping effect on the improving of electromech. properties, ceramic samples of Pb(B1/2Nb1/2)O3-PbTiO3, were prepd., where B are rare-earth elements Lu, Er, Tm, Ho. Ceramic characteristics, phase diagrams, dielec. and electromech. parameters are reported.

IT **263872-43-1**, Lead lutetium niobium titanium oxide (PbLu0.45Nb0.45Ti0.1O3) **263872-44-2**, Lead lutetium niobium titanium oxide (PbLu0.4Nb0.4Ti0.2O3) **267409-80-3**, Lead lutetium niobium titanium oxide (PbLu0.3Nb0.3Ti0.4O3) **273750-90-6**, Lead lutetium niobium titanium oxide (PbLu0.35Nb0.35Ti0.3O3) **273750-91-7**, Lead lutetium niobium titanium oxide (PbLu0.32Nb0.32Ti0.36O3) **273750-93-9**, Lead lutetium niobium titanium oxide (PbLu0.25Nb0.25Ti0.5O3) **273750-96-2**, Lead lutetium niobium titanium oxide (PbLu0.1Nb0.1Ti0.8O3) **386742-81-0**, Erbium lead niobium titanium oxide **386742-82-1**, Lead niobium thulium titanium oxide **386742-83-2**, Holmium lead niobium titanium oxide
RL: PEP (Physical, engineering or chemical process); PRP (Properties); PYP (Physical process); TEM (Technical or engineered material use); PROC (Process); USES (Uses)
(**ferroelecs.**; effects of La doping in Pb(RE1/2Nb1/2)O3-PbTiO3 (RE = Lu, Er, Tm, Ho) **ferroelecs**. in vicinity of morphotropic phase boundaries on phase equil. and electromech. and dielec. properties)

RN 263872-43-1 HCAPLUS

CN Lead lutetium niobium titanium oxide (PbLu0.45Nb0.45Ti0.1O3) (9CI) (CA INDEX NAME)

Component	Ratio	Component Registry Number
O	3	17778-80-2
Ti	0.1	7440-32-6
Nb	0.45	7440-03-1
Lu	0.45	7439-94-3
Pb	1	7439-92-1

RN 263872-44-2 HCAPLUS
CN Lead lutetium niobium titanium oxide (PbLu0.4Nb0.4Ti0.2O3) (9CI) (CA INDEX NAME)

Component	Ratio	Component Registry Number
O	3	17778-80-2
Ti	0.2	7440-32-6
Nb	0.4	7440-03-1
Lu	0.4	7439-94-3
Pb	1	7439-92-1

RN 267409-80-3 HCAPLUS
CN Lead lutetium niobium titanium oxide (PbLu0.3Nb0.3Ti0.4O3) (9CI) (CA INDEX NAME)

Component	Ratio	Component Registry Number
O	3	17778-80-2
Ti	0.4	7440-32-6
Nb	0.3	7440-03-1
Lu	0.3	7439-94-3
Pb	1	7439-92-1

RN 273750-90-6 HCAPLUS
CN Lead lutetium niobium titanium oxide (PbLu0.35Nb0.35Ti0.3O3) (9CI) (CA INDEX NAME)

Component	Ratio	Component Registry Number
O	3	17778-80-2
Ti	0.3	7440-32-6
Nb	0.35	7440-03-1
Lu	0.35	7439-94-3
Pb	1	7439-92-1

RN 273750-91-7 HCAPLUS
CN Lead lutetium niobium titanium oxide (PbLu0.32Nb0.32Ti0.36O3) (9CI) (CA INDEX NAME)

Component	Ratio	Component Registry Number
O	3	17778-80-2
Ti	0.36	7440-32-6
Nb	0.32	7440-03-1
Lu	0.32	7439-94-3
Pb	1	7439-92-1

RN 273750-93-9 HCAPLUS
CN Lead lutetium niobium titanium oxide (PbLu0.25Nb0.25Ti0.5O3) (9CI) (CA INDEX NAME)

Component	Ratio	Component Registry Number
O	3	17778-80-2
Ti	0.5	7440-32-6
Nb	0.25	7440-03-1
Lu	0.25	7439-94-3
Pb	1	7439-92-1

RN 273750-96-2 HCAPLUS
CN Lead lutetium niobium titanium oxide (PbLu0.1Nb0.1Ti0.8O3) (9CI) (CA INDEX NAME)

Component	Ratio	Component Registry Number
O	3	17778-80-2
Ti	0.8	7440-32-6
Nb	0.1	7440-03-1
Lu	0.1	7439-94-3
Pb	1	7439-92-1

RN 386742-81-0 HCAPLUS
CN Erbium lead niobium titanium oxide (9CI) (CA INDEX NAME)

Component	Ratio	Component Registry Number
O	x	17778-80-2
Er	x	7440-52-0
Ti	x	7440-32-6
Nb	x	7440-03-1
Pb	x	7439-92-1

RN 386742-82-1 HCAPLUS
CN Lead niobium thulium titanium oxide (9CI) (CA INDEX NAME)

Component	Ratio	Component Registry Number
O	x	17778-80-2
Ti	x	7440-32-6
Tm	x	7440-30-4
Nb	x	7440-03-1
Pb	x	7439-92-1

RN 386742-83-2 HCAPLUS

CN Holmium lead niobium titanium oxide (9CI) (CA INDEX NAME)

Component	Ratio	Component Registry Number
O	x	17778-80-2
Ho	x	7440-60-0
Ti	x	7440-32-6
Nb	x	7440-03-1
Pb	x	7439-92-1

CC 57-2 (Ceramics)
Section cross-reference(s): 68

ST rare earth lead niobate titanate **ferroelec** lanthanum doping property; phase diagram rare earth lead niobate titanate; lutetium lead niobate titanate phase diagram property; erbium lead niobate titanate phase diagram property; thulium lead niobate titanate phase diagram property; holmium lead niobate titanate phase diagram property; lanthanum doping rare earth lead niobate titanate property

IT **Ferroelectric** materials
(lead rare earth niobate titanate; effects of La doping in Pb(RE1/2Nb1/2)O3-PbTiO3 (RE = Lu, Er, Tm, Ho) **ferroelecs** . in vicinity of morphotropic phase boundaries on phase equil. and electromech. and dielec. properties)

IT **263872-43-1**, Lead lutetium niobium titanium oxide (PbLu0.45Nb0.45Ti0.1O3) **263872-44-2**, Lead lutetium niobium titanium oxide (PbLu0.4Nb0.4Ti0.2O3) **267409-80-3**, Lead lutetium niobium titanium oxide (PbLu0.3Nb0.3Ti0.4IO3) **273750-90-6**, Lead lutetium niobium titanium oxide (PbLu0.35Nb0.35Ti0.3O3) **273750-91-7**, Lead lutetium niobium titanium oxide (PbLu0.32Nb0.32Ti0.36O3) **273750-93-9**, Lead lutetium niobium titanium oxide (PbLu0.25Nb0.25Ti0.5O3) **273750-96-2**, Lead lutetium niobium titanium oxide (PbLu0.1Nb0.1Ti0.8O3) **386742-81-0**, Erbium lead niobium titanium oxide **386742-82-1**, Lead niobium thulium titanium oxide **386742-83-2**, Holmium lead niobium titanium oxide
RL: PEP (Physical, engineering or chemical process); PRP (Properties); PYP (Physical process); TEM (Technical or engineered material use); PROC (Process); USES (Uses)
(**ferroelecs.**; effects of La doping in Pb(RE1/2Nb1/2)O3-PbTiO3 (RE = Lu, Er, Tm, Ho) **ferroelecs** . in vicinity of morphotropic phase boundaries on phase equil. and electromech. and dielec. properties)

IT 12032-01-8, Lead lutetium niobium oxide (Pb2LuNbO6) 12060-00-3, Lead titanium oxide (PbTiO3) 12162-47-9, Holmium lead niobium oxide (HoPb2NbO6) 12434-07-0, Erbium lead niobium oxide (ErPb2NbO6) 12439-25-7, Lead niobium thulium oxide (Pb2NbTmO6)
RL: PEP (Physical, engineering or chemical process); PRP (Properties); PYP (Physical process); TEM (Technical or engineered material use); PROC (Process); USES (Uses)
(lead rare earth niobate titanate **ferroelecs.**; effects

of La doping in Pb(RE1/2Nb1/2)O3-PbTiO3 (RE = Lu, Er, Tm, Ho) **ferroelecs.** in vicinity of morphotropic phase boundaries on phase equil. and electromech. and dielec. properties)

L20 ANSWER 14 OF 30 HCAPLUS COPYRIGHT 2006 ACS on STN
2001:754370 Document No. 136:46579 Crystal growth and dielectric properties of solid solutions of Pb(Yb1/2Nb1/2)O3 with (PbTiO3) with a high Curie temperature near a morphotropic phase boundary. Yasuda, Naohiko; Ohwa, Hidehiro; Kume, Motoyuki; Hosono, Yasuharu; Yamashita, Yohachi; Ishino, Shinnichirou; Terauchi, Hikaru; Iwata, Makoto; Ishibashi, Yoshihiro (Department of Electrical and Electronic Engineering, Gifu University, Gifu, 501-1193, Japan). Japanese Journal of Applied Physics, Part 1: Regular Papers, Short Notes & Review Papers, 40(9B), 5664-5667 (English) 2001. CODEN: JAPNDE. Publisher: Japan Society of Applied Physics.

AB The Pb(Yb1/2Nb1/2)O3-PbTiO3 (PYN-PT) binary system single crystal near the morphotropic phase boundary (MPB) compn. with (100) planes of 1-2 mm length on one side was successfully grown by the flux method using PhO-PbF2-B2O3 flux. The PYN-PT (47/53) single crystal was found, by simultaneous microdifferential thermal anal. and thermogravimetric anal., to show a peritectic m.p. at 1205°C with a decompn. of the perovskite crystals into a pyrochlore phase and a liquidus point at 1253°C. The structure of the PYN-PT (47/53) single crystal was detd. by x-ray diffraction study to be tetragonal with a = 4.05 ± 0.01 A and c = 4.14 ± 0.01 A at room temp. The PYN-PT single crystal shows the max. value of the relative permittivity εr of 16000 at 1 kHz at a Curie temp. Tc of 404°C, which is as high as that in the Pb(Zr,Ti)O3 system near the MPB and the value of the remanent polarization Pr of about 26 μC/cm2 at 140°C.

IT **380405-46-9**, Lead niobium titanium ytterbium oxide (PbNb0.24Ti0.53Yb0.24O3)
RL: PEP (Physical, engineering or chemical process); PRP (Properties); PYP (Physical process); PROC (Process)
(crystal growth and dielec. properties of solid solns. of Pb(Yb1/2Nb1/2)O3-PbTiO3 with a high Curie temp. near a morphotropic phase boundary)

RN 380405-46-9 HCAPLUS
CN Lead niobium titanium ytterbium oxide (PbNb0.24Ti0.53Yb0.24O3) (9CI) (CA INDEX NAME)

Component	Ratio	Component Registry Number
O	3	17778-80-2
Yb	0.24	7440-64-4
Ti	0.53	7440-32-6
Nb	0.24	7440-03-1
Pb	1	7439-92-1

CC 76-9 (Electric Phenomena)
IT Crystal growth

Crystal structure
Curie temperature (**ferroelectric**)
Dielectric constant
Ferroelectricity
Melting point
Structural phase transition
Thermal analysis
Thermogravimetric analysis
(crystal growth and dielec. properties of solid solns. of Pb(Yb1/2Nb1/2)O3-PbTiO3 with a high Curie temp. near a morphotropic phase boundary)

IT **380405-46-9**, Lead niobium titanium ytterbium oxide (PbNb0.24Ti0.53Yb0.24O3)
RL: PEP (Physical, engineering or chemical process); PRP (Properties); PYP (Physical process); PROC (Process)
(crystal growth and dielec. properties of solid solns. of Pb(Yb1/2Nb1/2)O3-PbTiO3 with a high Curie temp. near a morphotropic phase boundary)

L20 ANSWER 15 OF 30 HCAPLUS COPYRIGHT 2006 ACS on STN
2001:485053 Document No. 135:203740 Transverse piezoelectric properties of epitaxial Pb(Yb1/2Nb1/2)O3-PbTiO3 (50/50) films. Yoshimura, T.; Trolier-McKinstry, S. (Materials Research Laboratory, The Pennsylvania State University, University Park, PA, 16802-4801, USA). Journal of Crystal Growth, 229, 445-449 (English) 2001. CODEN: JCRGAE. ISSN: 0022-0248. Publisher: Elsevier Science B.V..

AB The transverse piezoelec. properties of (1-x)Pb(Yb1/2Nb1/2)O3-xPbTiO3 (PYbN-PT, x=0.5) epitaxial films grown on (0 0 1)SrRuO3/(0 0 1)LaAlO3 (indexes given for the pseudocubic unit cell) were investigated by the wafer flexure technique. PYbN-PT films and SrRuO3 bottom electrodes were deposited by pulsed laser deposition. At a deposition pressure of 400 mTorr, (0 0 1) PYbN-PT epitaxial films with high phase purity and good cryst. quality were obtained for a wide range of deposition rates (40-100 nm/min) and temps. (620-660°C). The remanent polarization of the film was as high as 30 μC/cm2. The e31 coeff. and the aging rate were strongly dependent on the poling direction. The max. e31 coeff. was -11.0 C/m2. The min. aging rate of the piezoelec. coeffs. for the films was 2% per decade.

IT **170965-44-3**, Lead niobium titanium ytterbium oxide (PbNb0.25Ti0.5Yb0.25O3)
RL: PRP (Properties)
(transverse piezoelec. properties of epitaxial Pb(Yb1/2Nb1/2)O3-PbTiO3 (50/50) films)

RN 170965-44-3 HCAPLUS
CN Lead niobium titanium ytterbium oxide (PbNb0.25Ti0.5Yb0.25O3) (9CI) (CA INDEX NAME)

Component	Ratio	Component Registry Number
O	3	17778-80-2

Yb	0.25	7440-64-4
Ti	0.5	7440-32-6
Nb	0.25	7440-03-1
Pb	1	7439-92-1

CC 76-7 (Electric Phenomena)
IT **Ferroelectricity**
Laser radiation
(deposition)
IT **170965-44-3**, Lead niobium titanium ytterbium oxide (PbNb0.25Ti0.5Yb0.2503)
RL: PRP (Properties)
(transverse piezoelec. properties of epitaxial Pb(Yb1/2Nb1/2)O3-PbTiO3 (50/50) films)

L20 ANSWER 16 OF 30 HCAPLUS COPYRIGHT 2006 ACS on STN
2000:805494 Document No. 134:79501 Study of **ferroelectric** ceramics of Pb(B1/23+Nb1/2)O3-PbTiO3 solid solutions. Sternberg, A.; Shebanovs, L.; Yamashita, J.; Antonova, M.; Livins, M. (Inst. Fiz. Tverdogo Tela, Latv. Univ., Riga, Latvia). Izvestiya Akademii Nauk, Seriya Fizicheskaya, 64(6), 1211-1215 (Russian) 2000. CODEN: IRAFEO. ISSN: 1026-3489. Publisher: Nauka.
AB Solid solns. of the formulas (1-x)PbLu0.5Nb0.5O3·xPbTiO3 and (1-x)PbEr0.5Nb0.5O3·xPbTiO3 were prepd. by solid-state reactions. Their room-temp. phase diagrams, dielec. properties, and piezoelectricity were detd. as functions of x.
IT **233685-93-3P**, Erbium lead niobium titanium oxide (Er0.45PbNb0.45Ti0.1O3) **233685-94-4P**, Erbium lead niobium titanium oxide (Er0.4PbNb0.4Ti0.2O3) **233685-95-5P**, Erbium lead niobium titanium oxide (Er0.35PbNb0.35Ti0.3O3) **233685-97-7P**, Erbium lead niobium titanium oxide (Er0.3PbNb0.3Ti0.4O3) **233685-99-9P**, Erbium lead niobium titanium oxide (Er0.25PbNb0.25Ti0.5O3) **233686-00-5P**, Erbium lead niobium titanium oxide (Er0.2PbNb0.2Ti0.6O3) **233686-01-6P**, Erbium lead niobium titanium oxide (Er0.15PbNb0.15Ti0.7O3) **233686-02-7P**, Erbium lead niobium titanium oxide (Er0.1PbNb0.1Ti0.8O3) **263872-43-1P**, Lead lutetium niobium titanium oxide (PbLu0.45Nb0.45Ti0.1O3) **263872-44-2P**, Lead lutetium niobium titanium oxide (PbLu0.4Nb0.4Ti0.2O3) **267409-80-3P**, Lead lutetium niobium titanium oxide (PbLu0.3Nb0.3Ti0.4IO3) **273750-90-6P**, Lead lutetium niobium titanium oxide (PbLu0.35Nb0.35Ti0.3O3) **273750-91-7P**, Lead lutetium niobium titanium oxide (PbLu0.32Nb0.32Ti0.36O3) **273750-93-9P**, Lead lutetium niobium titanium oxide (PbLu0.25Nb0.25Ti0.5O3) **273750-96-2P**, Lead lutetium niobium titanium oxide (PbLu0.1Nb0.1Ti0.8O3) **315204-16-1P**, Lead lutetium niobium titanium oxide (PbLu0.3Nb0.3Ti0.39O3)
RL: PEP (Physical, engineering or chemical process); PRP (Properties); SPN (Synthetic preparation); PREP (Preparation); PROC (Process)
(prepn. and properties of (1-x)PbLu0.5Nb0.5O3·xPbTiO3 and

(1-x)PbEr0.5Nb0.5O3·xPbTiO3)

RN 233685-93-3 HCAPLUS

CN Erbium lead niobium titanium oxide (Er0.45PbNb0.45Ti0.1O3) (9CI) (CA INDEX NAME)

Component	Ratio	Component Registry Number
O	3	17778-80-2
Er	0.45	7440-52-0
Ti	0.1	7440-32-6
Nb	0.45	7440-03-1
Pb	1	7439-92-1

RN 233685-94-4 HCAPLUS

CN Erbium lead niobium titanium oxide (Er0.4PbNb0.4Ti0.2O3) (9CI) (CA INDEX NAME)

Component	Ratio	Component Registry Number
O	3	17778-80-2
Er	0.4	7440-52-0
Ti	0.2	7440-32-6
Nb	0.4	7440-03-1
Pb	1	7439-92-1

RN 233685-95-5 HCAPLUS

CN Erbium lead niobium titanium oxide (Er0.35PbNb0.35Ti0.3O3) (9CI) (CA INDEX NAME)

Component	Ratio	Component Registry Number
O	3	17778-80-2
Er	0.35	7440-52-0
Ti	0.3	7440-32-6
Nb	0.35	7440-03-1
Pb	1	7439-92-1

RN 233685-97-7 HCAPLUS

CN Erbium lead niobium titanium oxide (Er0.3PbNb0.3Ti0.4O3) (9CI) (CA INDEX NAME)

Component	Ratio	Component Registry Number
O	3	17778-80-2
Er	0.3	7440-52-0
Ti	0.4	7440-32-6
Nb	0.3	7440-03-1
Pb	1	7439-92-1

RN 233685-99-9 HCAPLUS
CN Erbium lead niobium titanium oxide (Er0.25PbNb0.25Ti0.5O3) (9CI) (CA INDEX NAME)

Component	Ratio	Component Registry Number
O	3	17778-80-2
Er	0.25	7440-52-0
Ti	0.5	7440-32-6
Nb	0.25	7440-03-1
Pb	1	7439-92-1

RN 233686-00-5 HCAPLUS
CN Erbium lead niobium titanium oxide (Er0.2PbNb0.2Ti0.6O3) (9CI) (CA INDEX NAME)

Component	Ratio	Component Registry Number
O	3	17778-80-2
Er	0.2	7440-52-0
Ti	0.6	7440-32-6
Nb	0.2	7440-03-1
Pb	1	7439-92-1

RN 233686-01-6 HCAPLUS
CN Erbium lead niobium titanium oxide (Er0.15PbNb0.15Ti0.7O3) (9CI) (CA INDEX NAME)

Component	Ratio	Component Registry Number
O	3	17778-80-2
Er	0.15	7440-52-0
Ti	0.7	7440-32-6
Nb	0.15	7440-03-1
Pb	1	7439-92-1

RN 233686-02-7 HCAPLUS
CN Erbium lead niobium titanium oxide (Er0.1PbNb0.1Ti0.8O3) (9CI) (CA INDEX NAME)

Component	Ratio	Component Registry Number
O	3	17778-80-2
Er	0.1	7440-52-0
Ti	0.8	7440-32-6
Nb	0.1	7440-03-1
Pb	1	7439-92-1

RN 263872-43-1 HCAPLUS
CN Lead lutetium niobium titanium oxide (PbLu0.45Nb0.45Ti0.1O3) (9CI) (CA INDEX NAME)

Component	Ratio	Component Registry Number
O	3	17778-80-2
Ti	0.1	7440-32-6
Nb	0.45	7440-03-1
Lu	0.45	7439-94-3
Pb	1	7439-92-1

RN 263872-44-2 HCAPLUS
CN Lead lutetium niobium titanium oxide (PbLu0.4Nb0.4Ti0.2O3) (9CI) (CA INDEX NAME)

Component	Ratio	Component Registry Number
O	3	17778-80-2
Ti	0.2	7440-32-6
Nb	0.4	7440-03-1
Lu	0.4	7439-94-3
Pb	1	7439-92-1

RN 267409-80-3 HCAPLUS
CN Lead lutetium niobium titanium oxide (PbLu0.3Nb0.3Ti0.41O3) (9CI) (CA INDEX NAME)

Component	Ratio	Component Registry Number
O	3	17778-80-2
Ti	0.41	7440-32-6
Nb	0.3	7440-03-1
Lu	0.3	7439-94-3
Pb	1	7439-92-1

RN 273750-90-6 HCAPLUS
CN Lead lutetium niobium titanium oxide (PbLu0.35Nb0.35Ti0.3O3) (9CI) (CA INDEX NAME)

Component	Ratio	Component Registry Number
O	3	17778-80-2
Ti	0.3	7440-32-6
Nb	0.35	7440-03-1
Lu	0.35	7439-94-3
Pb	1	7439-92-1

RN 273750-91-7 HCAPLUS
CN Lead lutetium niobium titanium oxide (PbLu0.32Nb0.32Ti0.36O3) (9CI) (CA INDEX NAME)

Component	Ratio	Component Registry Number
O	3	17778-80-2
Ti	0.36	7440-32-6
Nb	0.32	7440-03-1
Lu	0.32	7439-94-3
Pb	1	7439-92-1

RN 273750-93-9 HCAPLUS
CN Lead lutetium niobium titanium oxide (PbLu0.25Nb0.25Ti0.5O3) (9CI) (CA INDEX NAME)

Component	Ratio	Component Registry Number
O	3	17778-80-2
Ti	0.5	7440-32-6
Nb	0.25	7440-03-1
Lu	0.25	7439-94-3
Pb	1	7439-92-1

RN 273750-96-2 HCAPLUS
CN Lead lutetium niobium titanium oxide (PbLu0.1Nb0.1Ti0.8O3) (9CI) (CA INDEX NAME)

Component	Ratio	Component Registry Number
O	3	17778-80-2
Ti	0.8	7440-32-6
Nb	0.1	7440-03-1
Lu	0.1	7439-94-3
Pb	1	7439-92-1

RN 315204-16-1 HCAPLUS
CN Lead lutetium niobium titanium oxide (PbLu0.3Nb0.3Ti0.39O3) (9CI) (CA INDEX NAME)

Component	Ratio	Component Registry Number
O	3	17778-80-2
Ti	0.39	7440-32-6
Nb	0.3	7440-03-1
Lu	0.3	7439-94-3
Pb	1	7439-92-1

CC 76-8 (Electric Phenomena)
Section cross-reference(s): 57
ST lead lutetium erbium niobate titanate dielec piezoelec; **ferroelectricity** lead lutetium erbium niobate titanate
IT **Ferroelectric** materials
(ceramic; prepn. and properties of (1-x)PbLu0.5Nb0.5O3·xPbTiO3 and (1-x)PbEr0.5Nb0.5O3·xPbTiO3)
IT 12032-01-8P, Lead lutetium niobium oxide (Pb2LuNbO6) 12060-00-3P, Lead titanium oxide (PbTiO3) 12434-07-0P, Erbium lead niobium oxide (ErPb2NbO6) **233685-93-3P**, Erbium lead niobium titanium oxide (Er0.45PbNb0.45Ti0.1O3) **233685-94-4P**, Erbium lead niobium titanium oxide (Er0.4PbNb0.4Ti0.2O3) **233685-95-5P**, Erbium lead niobium titanium oxide (Er0.35PbNb0.35Ti0.3O3) **233685-97-7P**, Erbium lead niobium titanium oxide (Er0.3PbNb0.3Ti0.4O3) **233685-99-9P**, Erbium lead niobium titanium oxide (Er0.25PbNb0.25Ti0.5O3) **233686-00-5P**, Erbium lead niobium titanium oxide (Er0.2PbNb0.2Ti0.6O3) **233686-01-6P**, Erbium lead niobium titanium oxide (Er0.15PbNb0.15Ti0.7O3) **233686-02-7P**, Erbium lead niobium titanium oxide (Er0.1PbNb0.1Ti0.8O3) **263872-43-1P**, Lead lutetium niobium titanium oxide (PbLu0.45Nb0.45Ti0.1O3) **263872-44-2P**, Lead lutetium niobium titanium oxide (PbLu0.4Nb0.4Ti0.2O3) **267409-80-3P**, Lead lutetium niobium titanium oxide (PbLu0.3Nb0.3Ti0.4O3) **273750-90-6P**, Lead lutetium niobium titanium oxide (PbLu0.35Nb0.35Ti0.3O3) **273750-91-7P**, Lead lutetium niobium titanium oxide (PbLu0.32Nb0.32Ti0.36O3) **273750-93-9P**, Lead lutetium niobium titanium oxide (PbLu0.25Nb0.25Ti0.5O3) **273750-96-2P**, Lead lutetium niobium titanium oxide (PbLu0.1Nb0.1Ti0.8O3) **315204-16-1P**, Lead lutetium niobium titanium oxide (PbLu0.3Nb0.3Ti0.39O3)
RL: PEP (Physical, engineering or chemical process); PRP (Properties); SPN (Synthetic preparation); PREP (Preparation); PROC (Process)
(prepn. and properties of (1-x)PbLu0.5Nb0.5O3·xPbTiO3 and (1-x)PbEr0.5Nb0.5O3·xPbTiO3)

L20 ANSWER 17 OF 30 HCAPLUS COPYRIGHT 2006 ACS on STN
2000:367884 Document No. 133:93212 Morphotropic ceramic solid solutions of the Pb(B3+1/2Nb1/2)O3-PbTiO3 binary system. Sternberg, Andris; Shebanovs, Leonids; Yamashita, John Y.; Antonova, Maija; Livinsh, Maris (Institute of Solid State Physics, University of Latvia, Riga, LV-1063, Latvia). Ferroelectrics, 241(1-4), 1695-1702 (English) 2000. CODEN: FEROA8. ISSN: 0015-0193. Publisher: Gordon & Breach Science Publishers.
AB The structure, dielec., **ferroelec.** and electromech. properties of lead lutetium niobate-titanate (PLuNT) and lead erbium niobate-titanate (PErNT) binary systems are reported. The data of phase diagram, crystallog. symmetry and morphotropic phase boundaries (MPB) are provided. High values of the electromech.

coupling coeffs. kp = 0.66, kt = 0.48, k31 = 0.36 of (1-x)PLuN-xPT ceramics are attained in compns. near the MPB at x≈0.41.

IT **233685-98-8**, Erbium lead niobium titanium oxide (Er0.3PbNb0.3Ti0.4103) **263872-43-1**, Lead lutetium niobium titanium oxide (PbLu0.45Nb0.45Ti0.103) **263872-44-2**, Lead lutetium niobium titanium oxide (PbLu0.4Nb0.4Ti0.203) **267409-80-3**, Lead lutetium niobium titanium oxide (PbLu0.3Nb0.3Ti0.4103) **273750-90-6**, Lead lutetium niobium titanium oxide (PbLu0.35Nb0.35Ti0.303) **273750-93-9**, Lead lutetium niobium titanium oxide (PbLu0.25Nb0.25Ti0.503) **273750-96-2**, Lead lutetium niobium titanium oxide (PbLu0.1Nb0.1Ti0.803)
RL: PEP (Physical, engineering or chemical process); PRP (Properties); TEM (Technical or engineered material use); PROC (Process); USES (Uses)
(**ferroelecs.**; structure, dielec., **ferroelec.** and electromech. properties of morphotropic ceramic solid solns. of the Pb(B3+1/2Nb1/2)O3-PbTiO3 binary system (B = Lu and Er))

RN 233685-98-8 HCAPLUS
CN Erbium lead niobium titanium oxide (Er0.3PbNb0.3Ti0.4103) (9CI) (CA INDEX NAME)

Component	Ratio	Component Registry Number
O	3	17778-80-2
Er	0.3	7440-52-0
Ti	0.41	7440-32-6
Nb	0.3	7440-03-1
Pb	1	7439-92-1

RN 263872-43-1 HCAPLUS
CN Lead lutetium niobium titanium oxide (PbLu0.45Nb0.45Ti0.103) (9CI) (CA INDEX NAME)

Component	Ratio	Component Registry Number
O	3	17778-80-2
Ti	0.1	7440-32-6
Nb	0.45	7440-03-1
Lu	0.45	7439-94-3
Pb	1	7439-92-1

RN 263872-44-2 HCAPLUS
CN Lead lutetium niobium titanium oxide (PbLu0.4Nb0.4Ti0.203) (9CI) (CA INDEX NAME)

Component	Ratio	Component Registry Number
O	3	17778-80-2

Ti	0.2	7440-32-6
Nb	0.4	7440-03-1
Lu	0.4	7439-94-3
Pb	1	7439-92-1

RN 267409-80-3 HCAPLUS
CN Lead lutetium niobium titanium oxide (PbLu0.3Nb0.3Ti0.4O3) (9CI) (CA INDEX NAME)

Component	Ratio	Component Registry Number
O	3	17778-80-2
Ti	0.41	7440-32-6
Nb	0.3	7440-03-1
Lu	0.3	7439-94-3
Pb	1	7439-92-1

RN 273750-90-6 HCAPLUS
CN Lead lutetium niobium titanium oxide (PbLu0.35Nb0.35Ti0.3O3) (9CI) (CA INDEX NAME)

Component	Ratio	Component Registry Number
O	3	17778-80-2
Ti	0.3	7440-32-6
Nb	0.35	7440-03-1
Lu	0.35	7439-94-3
Pb	1	7439-92-1

RN 273750-93-9 HCAPLUS
CN Lead lutetium niobium titanium oxide (PbLu0.25Nb0.25Ti0.5O3) (9CI) (CA INDEX NAME)

Component	Ratio	Component Registry Number
O	3	17778-80-2
Ti	0.5	7440-32-6
Nb	0.25	7440-03-1
Lu	0.25	7439-94-3
Pb	1	7439-92-1

RN 273750-96-2 HCAPLUS
CN Lead lutetium niobium titanium oxide (PbLu0.1Nb0.1Ti0.8O3) (9CI) (CA INDEX NAME)

Component	Ratio	Component Registry Number
O	3	17778-80-2

Ti	0.8	7440-32-6
Nb	0.1	7440-03-1
Lu	0.1	7439-94-3
Pb	1	7439-92-1

CC 57-2 (Ceramics)
Section cross-reference(s): 75, 76

ST lead rare earth niobate titanate structure **ferroelec** property; lutetium rare earth niobate titanate structure **ferroelec** property; erbium rare earth niobate titanate structure **ferroelec** property

IT **Ferroelectricity**
(coercive field; structure, dielec., **ferroelec.** and electromech. properties of morphotropic ceramic solid solns. of the Pb(B3+1/2Nb1/2)O3-PbTiO3 binary system (B = Lu and Er))

IT Piezoelectricity
(electromech. coupling factor; structure, dielec., **ferroelec.** and electromech. properties of morphotropic ceramic solid solns. of the Pb(B3+1/2Nb1/2)O3-PbTiO3 binary system (B = Lu and Er))

IT **Ferroelectric** materials
(lead erbium niobate titanate; structure, dielec., **ferroelec.** and electromech. properties of morphotropic ceramic solid solns. of the Pb(B3+1/2Nb1/2)O3-PbTiO3 binary system (B = Lu and Er))

IT **Ferroelectric** materials
(lead lutetium niobate titanate; structure, dielec., **ferroelec.** and electromech. properties of morphotropic ceramic solid solns. of the Pb(B3+1/2Nb1/2)O3-PbTiO3 binary system (B = Lu and Er))

IT Dielectric constant
(structure, dielec., **ferroelec.** and electromech. properties of morphotropic ceramic solid solns. of the Pb(B3+1/2Nb1/2)O3-PbTiO3 binary system (B = Lu and Er))

IT **233685-98-8**, Erbium lead niobium titanium oxide (Er0.3PbNb0.3Ti0.4O3) **263872-43-1**, Lead lutetium niobium titanium oxide (PbLu0.45Nb0.45Ti0.1O3) **263872-44-2**, Lead lutetium niobium titanium oxide (PbLu0.4Nb0.4Ti0.2O3) **267409-80-3**, Lead lutetium niobium titanium oxide (PbLu0.3Nb0.3Ti0.4O3) **273750-90-6**, Lead lutetium niobium titanium oxide (PbLu0.35Nb0.35Ti0.3O3) **273750-93-9**, Lead lutetium niobium titanium oxide (PbLu0.25Nb0.25Ti0.5O3) **273750-96-2**, Lead lutetium niobium titanium oxide (PbLu0.1Nb0.1Ti0.8O3)
RL: PEP (Physical, engineering or chemical process); PRP (Properties); TEM (Technical or engineered material use); PROC (Process); USES (Uses)
(**ferroelecs.**; structure, dielec., **ferroelec.** and electromech. properties of morphotropic ceramic solid solns. of the Pb(B3+1/2Nb1/2)O3-PbTiO3 binary system (B = Lu and Er))

IT 12032-01-8, Lead lutetium niobate PbLu0.5Nb0.5O3 12060-00-3, Lead titanium oxide (PbTiO3) 12434-07-0, Erbium lead niobium oxide

(ErPb2NbO6)
RL: PEP (Physical, engineering or chemical process); PRP (Properties); TEM (Technical or engineered material use); PROC (Process); USES (Uses)
(rare earth niobate titanate **ferroelecs.**; structure, dielec., **ferroelec.** and electromech. properties of morphotropic ceramic solid solns. of the Pb(B3+1/2Nb1/2)O3-PbTiO3 binary system (B = Lu and Er))

L20 ANSWER 18 OF 30 HCAPLUS COPYRIGHT 2006 ACS on STN
2000:276610 Document No. 132:341489 Effects of structure ordering, structure defects and external conditions on properties of complex **ferroelectric** perovskites. Sternberg, A.; Shebanovs, L.; Birks, E.; Yamashita, Y.; Tyunina, M.; Zauls, V. (Institute of Solid State Physics, University of Latvia, Riga, LV-1063, Latvia). Ferroelectrics, 217(1-4), 307-317 (English) 1998. CODEN: FEROA8. ISSN: 0015-0193. Publisher: Gordon & Breach Science Publishers.
AB A review with 11 refs. Structural rearrangements in lead-contg. (A' A") (B' B")O3 type perovskite compds. are caused by technol. treatment, high-energy radiation and ambient conditions. Variation of structure ordering along with modification (substituted or defected solid solns.) may provide promising compns. for applications, e.g., cascade microcryogenic devices (PST solid solns.); efficient piezoelec. materials - here the new (1-x)Pb(Lu1/2Nb1/2)O3-xPbTiO3 system in the morphotropic region. The max. values of the electromech. coupling coeffs. kp = 0.663, kt = 0.481, k31 = 0.355 were attained in compns. PLuNT 59/41 (Tm = 353°C) near the morphotropic phase boundary. In P(L)ZT and PLT thin films asymmetry of piezoelec. coeff. d33 hysteresis diminished values of d33 and their frequency dependence were attributed to residual stress at the film-substrate/electrode interfaces and unrelaxed strain characteristic in highly oriented thin films. Neutron irradn. by fluence 1018n/cm2 causes some changes in thin film properties, however, they are less pronounced compared to bulk material of the same compn.
IT **267409-80-3**, Lead lutetium niobium titanium oxide (PbLu0.3Nb0.3Ti0.41O3) **267409-82-5**, Lead lutetium niobium titanium oxide
RL: PEP (Physical, engineering or chemical process); PRP (Properties); PROC (Process)
(effects of structure ordering, structure defects and external conditions on properties of complex **ferroelec.** perovskites)
RN 267409-80-3 HCAPLUS
CN Lead lutetium niobium titanium oxide (PbLu0.3Nb0.3Ti0.41O3) (9CI) (CA INDEX NAME)

Component	Ratio	Component Registry Number
O	3	17778-80-2
Ti	0.41	7440-32-6

Nb	0.3	7440-03-1
Lu	0.3	7439-94-3
Pb	1	7439-92-1

RN 267409-82-5 HCAPLUS
CN Lead lutetium niobium titanium oxide (9CI) (CA INDEX NAME)

Component	Ratio	Component Registry Number
O	x	17778-80-2
Ti	x	7440-32-6
Nb	x	7440-03-1
Lu	x	7439-94-3
Pb	x	7439-92-1

CC 76-0 (Electric Phenomena)
Section cross-reference(s): 75
ST **ferroelec** perovskite structure piezoelectricity review
IT Crystal defects
Ferroelectric materials
Hysteresis
Order-disorder transition
Perovskite-type crystals
Piezoelectricity
Radiation induced crystal defects
Strain
(effects of structure ordering, structure defects and external conditions on properties of complex **ferroelec.** perovskites)
IT 12626-80-1, Lanthanum lead titanium oxide 12676-60-7, Lanthanum lead titanium zirconium oxide **267409-80-3**, Lead lutetium niobium titanium oxide (PbLu0.3Nb0.3Ti0.4103) **267409-82-5**, Lead lutetium niobium titanium oxide
RL: PEP (Physical, engineering or chemical process); PRP (Properties); PROC (Process)
(effects of structure ordering, structure defects and external conditions on properties of complex **ferroelec.** perovskites)
IT 12586-31-1, Neutron
RL: PEP (Physical, engineering or chemical process); PROC (Process)
(irradn.; effects of structure ordering, structure defects and external conditions on properties of complex **ferroelec.** perovskites)

L20 ANSWER 19 OF 30 HCAPLUS COPYRIGHT 2006 ACS on STN
2000:178222 Document No. 132:287146 Structure and properties of high piezoelectric coupling Pb(B'1/2Nb1/2)O3-PbTiO3 binary systems. Sternberg, Andris; Shebanovs, Leonids; Yamashita, John Y.; Antonova, Maija; Livinsh, Maris; Shorubalko, Ivan (Institute of Solid State Physics University of Latvia, Riga, LV-1063, Latvia). Ferroelectrics, 224(1-4), 565-572 (English) 1999. CODEN: FEROA8.

ISSN: 0015-0193. Publisher: Gordon & Breach Science Publishers.

AB The (1-x)Pb(Lu1/2 Nb1/2)O3-xPbTiO3 and (1-x)Pb(Er1/2 Nb1/2)O3-xPbTiO3 binary systems have been obtained, the structure and properties of which are studied. The unit cell of erbium niobate (PErN) is described as pseudomonoclinic of orthorhombic Bmm2 symmetry: a=c=4.2161 Å;b=4.0869 Å;β=90.55° and compn. is characterized with antiferroelec. phase transition at 305°C. The PErNT system has the morphotropic phase region extending over the x=0.4-0.6 interval. In PLuNT ceramics system the pseudomonoclinic phase structure Bmm2 extending over the 0≤x ≤0.38 interval becomes pseudocubic at x≈ 0.2. The morphotropic region is spread over 0.38< x <0.49; at higher PT concns. (1.0 ≥ x ≥ 0.49) the structure transfers to the tetragonal P4mm phase. The max. values of the electromech. coupling coeffs. kp=0.66, k1=0.48, k31=0.35 were attained in compns. PLuNT 59/41 near the morphotropic phase boundary.

IT **233686-03-8P**, Erbium lead niobium titanium oxide (Er0-0.5PbNb0-0.5Ti0-1O3) **263871-47-2P**, Lead lutetium niobium titanium oxide (PbLu0-0.5Nb0-0.5Ti0-1O3) **263872-43-1P**, Lead lutetium niobium titanium oxide (PbLu0.45Nb0.45Ti0.1O3) **263872-44-2P**, Lead lutetium niobium titanium oxide (PbLu0.4Nb0.4Ti0.2O3)
RL: PRP (Properties); SPN (Synthetic preparation); TEM (Technical or engineered material use); PREP (Preparation); USES (Uses)
(structure and properties of high piezoelec. coupling Pb(B'1/2Nb1/2)O3-PbTiO3 binary systems)

RN 233686-03-8 HCAPLUS
CN Erbium lead niobium titanium oxide (Er0-0.5PbNb0-0.5Ti0-1O3) (9CI) (CA INDEX NAME)

Component	Ratio	Component Registry Number
O	3	17778-80-2
Er	0 - 0.5	7440-52-0
Ti	0 - 1	7440-32-6
Nb	0 - 0.5	7440-03-1
Pb	1	7439-92-1

RN 263871-47-2 HCAPLUS
CN Lead lutetium niobium titanium oxide (PbLu0-0.5Nb0-0.5Ti0-1O3) (9CI) (CA INDEX NAME)

Component	Ratio	Component Registry Number
O	3	17778-80-2
Ti	0 - 1	7440-32-6
Nb	0 - 0.5	7440-03-1
Lu	0 - 0.5	7439-94-3
Pb	1	7439-92-1

RN 263872-43-1 HCAPLUS
CN Lead lutetium niobium titanium oxide (PbLu0.45Nb0.45Ti0.1O3) (9CI) (CA INDEX NAME)

Component	Ratio	Component Registry Number
O	3	17778-80-2
Ti	0.1	7440-32-6
Nb	0.45	7440-03-1
Lu	0.45	7439-94-3
Pb	1	7439-92-1

RN 263872-44-2 HCAPLUS
CN Lead lutetium niobium titanium oxide (PbLu0.4Nb0.4Ti0.2O3) (9CI) (CA INDEX NAME)

Component	Ratio	Component Registry Number
O	3	17778-80-2
Ti	0.2	7440-32-6
Nb	0.4	7440-03-1
Lu	0.4	7439-94-3
Pb	1	7439-92-1

CC 76-7 (Electric Phenomena)
Section cross-reference(s): 57, 75
ST lead lutetium erbium niobium titanium oxide **ferroelec** ceramics piezoelectricity
IT **Ferroelectric** materials
(ceramic; structure and properties of high piezoelec. coupling Pb(B'1/2Nb1/2)O3-PbTiO3 binary systems)
IT Calcination
Crystal structure-property relationship
Density
Dielectric constant
Dielectric polarization
Ferroelectric transition
Grain size
Phase diagram
Piezoelectricity
(structure and properties of high piezoelec. coupling Pb(B'1/2Nb1/2)O3-PbTiO3 binary systems)
IT 12032-01-8P, Lead lutetium niobium oxide (Pb2LuNbO6) 12434-07-0P, Erbium lead niobium oxide (ErPb2NbO6) **233686-03-8P**, Erbium lead niobium titanium oxide (Er0-0.5PbNb0-0.5Ti0-1O3) **263871-47-2P**, Lead lutetium niobium titanium oxide (PbLu0-0.5Nb0-0.5Ti0-1O3) **263872-43-1P**, Lead lutetium niobium titanium oxide (PbLu0.45Nb0.45Ti0.1O3) **263872-44-2P**, Lead lutetium niobium titanium oxide (PbLu0.4Nb0.4Ti0.2O3)
RL: PRP (Properties); SPN (Synthetic preparation); TEM (Technical or

engineered material use); PREP (Preparation); USES (Uses)
(structure and properties of high piezoelec. coupling Pb(B'1/2Nb1/2)O3-PbTiO3 binary systems)

L20 ANSWER 20 OF 30 HCAPLUS COPYRIGHT 2006 ACS on STN
1999:694542 Document No. 131:358986 Dielectric properties and x-ray study of Zr-substituted Pb(Yb1/2Nb1/2)O3 ceramics. Kim, Jai-Hyun; Im, Ki Vin; Choo, Woong Kil (Department of Materials Science and Engineering, Korea Advanced Institute of Science and Technology, Taejon, S. Korea). Japanese Journal of Applied Physics, Part 1: Regular Papers, Short Notes & Review Papers, 38(9B), 5474-5477 (English) 1999. CODEN: JAPNDE. ISSN: 0021-4922. Publisher: Japanese Journal of Applied Physics.

AB The dielec. behavior and the crystal structure of (1-x)Pb(Yb1/2Nb1/2)O3-xPbZrO3 (PYN1-xPZx) ($0 \leq x \leq 0.6$) solid soln. have been studied. In the PYN-rich compn. range ($0 \leq x \leq 0.3$), the paraelec. (PE)-antiferroelec. (AFE) phase transition takes place sharply and is independent of the applied frequency. However, on increasing PZ concn., the dielec. const. vs. temp. curve becomes gradually broader and the apparent transition temp. becomes frequency-dependent. For $0.33 \leq x \leq 0.60$, the crystal structure becomes pseudo-cubic from the PYN's orthorhombic and a typical relaxor phase transition is clearly established.

IT **184363-31-3P**, Lead niobium ytterbium zirconium oxide (PbNb0.45Yb0.45Zr0.1O3) **184363-42-6P**, Lead niobium ytterbium zirconium oxide (PbNb0.2Yb0.2Zr0.6O3) **184363-44-8P**, Lead niobium ytterbium zirconium oxide (PbNb0.3Yb0.3Zr0.4O3) **184363-46-0P**, Lead niobium ytterbium zirconium oxide (PbNb0.35Yb0.35Zr0.3O3) **184363-48-2P**, Lead niobium ytterbium zirconium oxide (PbNb0.4Yb0.4Zr0.2O3) **247042-84-8P**, Lead niobium ytterbium zirconium oxide (PbNb0.25Yb0.25Zr0.5O3) **250679-55-1P**, Lead niobium ytterbium zirconium oxide (PbNb0.34Yb0.34Zr0.33O3) **250679-56-2P**, Lead niobium ytterbium zirconium oxide (PbNb0.32Yb0.32Zr0.35O3) **250679-57-3P**, Lead niobium ytterbium zirconium oxide (PbNb0.32Yb0.32Zr0.37O3)
RL: PNU (Preparation, unclassified); PRP (Properties); PREP (Preparation)
(dielec. properties and x-ray study of Zr-substituted Pb(Yb1/2Nb1/2)O3 ceramics)

RN 184363-31-3 HCAPLUS
CN Lead niobium ytterbium zirconium oxide (PbNb0.45Yb0.45Zr0.1O3) (9CI) (CA INDEX NAME)

Component	Ratio	Component Registry Number
O	3	17778-80-2
Zr	0.1	7440-67-7
Yb	0.45	7440-64-4
Nb	0.45	7440-03-1

Pb	1	7439-92-1

RN 184363-42-6 HCAPLUS
CN Lead niobium ytterbium zirconium oxide (PbNb0.2Yb0.2Zr0.6O3) (9CI) (CA INDEX NAME)

Component	Ratio	Component Registry Number
O	3	17778-80-2
Zr	0.6	7440-67-7
Yb	0.2	7440-64-4
Nb	0.2	7440-03-1
Pb	1	7439-92-1

RN 184363-44-8 HCAPLUS
CN Lead niobium ytterbium zirconium oxide (PbNb0.3Yb0.3Zr0.4O3) (9CI) (CA INDEX NAME)

Component	Ratio	Component Registry Number
O	3	17778-80-2
Zr	0.4	7440-67-7
Yb	0.3	7440-64-4
Nb	0.3	7440-03-1
Pb	1	7439-92-1

RN 184363-46-0 HCAPLUS
CN Lead niobium ytterbium zirconium oxide (PbNb0.35Yb0.35Zr0.3O3) (9CI) (CA INDEX NAME)

Component	Ratio	Component Registry Number
O	3	17778-80-2
Zr	0.3	7440-67-7
Yb	0.35	7440-64-4
Nb	0.35	7440-03-1
Pb	1	7439-92-1

RN 184363-48-2 HCAPLUS
CN Lead niobium ytterbium zirconium oxide (PbNb0.4Yb0.4Zr0.2O3) (9CI) (CA INDEX NAME)

Component	Ratio	Component Registry Number
O	3	17778-80-2
Zr	0.2	7440-67-7
Yb	0.4	7440-64-4
Nb	0.4	7440-03-1

Pb	1	7439-92-1

RN 247042-84-8 HCAPLUS
CN Lead niobium ytterbium zirconium oxide (PbNb0.25Yb0.25Zr0.5O3) (9CI) (CA INDEX NAME)

Component	Ratio	Component Registry Number
O	3	17778-80-2
Zr	0.5	7440-67-7
Yb	0.25	7440-64-4
Nb	0.25	7440-03-1
Pb	1	7439-92-1

RN 250679-55-1 HCAPLUS
CN Lead niobium ytterbium zirconium oxide (PbNb0.34Yb0.34Zr0.33O3) (9CI) (CA INDEX NAME)

Component	Ratio	Component Registry Number
O	3	17778-80-2
Zr	0.33	7440-67-7
Yb	0.34	7440-64-4
Nb	0.34	7440-03-1
Pb	1	7439-92-1

RN 250679-56-2 HCAPLUS
CN Lead niobium ytterbium zirconium oxide (PbNb0.32Yb0.32Zr0.35O3) (9CI) (CA INDEX NAME)

Component	Ratio	Component Registry Number
O	3	17778-80-2
Zr	0.35	7440-67-7
Yb	0.32	7440-64-4
Nb	0.32	7440-03-1
Pb	1	7439-92-1

RN 250679-57-3 HCAPLUS
CN Lead niobium ytterbium zirconium oxide (PbNb0.32Yb0.32Zr0.37O3) (9CI) (CA INDEX NAME)

Component	Ratio	Component Registry Number
O	3	17778-80-2
Zr	0.37	7440-67-7
Yb	0.32	7440-64-4
Nb	0.32	7440-03-1

Pb | 1 | 7439-92-1

CC 76-9 (Electric Phenomena)
Section cross-reference(s): 57
IT **Ferroelectric** materials
(ceramic; dielec. properties and x-ray study of Zr-substituted Pb(Yb1/2Nb1/2)O3 ceramics)
IT Antiferroelectricity
Crystal structure
Curie temperature (**ferroelectric**)
Dielectric constant
Dielectric hysteresis
Ferroelectric transition
Phase diagram
Solid solutions
(dielec. properties and x-ray study of Zr-substituted Pb(Yb1/2Nb1/2)O3 ceramics)
IT **184363-31-3P**, Lead niobium ytterbium zirconium oxide (PbNb0.45Yb0.45Zr0.1O3) **184363-42-6P**, Lead niobium ytterbium zirconium oxide (PbNb0.2Yb0.2Zr0.6O3) **184363-44-8P**, Lead niobium ytterbium zirconium oxide (PbNb0.3Yb0.3Zr0.4O3) **184363-46-0P**, Lead niobium ytterbium zirconium oxide (PbNb0.35Yb0.35Zr0.3O3) **184363-48-2P**, Lead niobium ytterbium zirconium oxide (PbNb0.4Yb0.4Zr0.2O3) **247042-84-8P**, Lead niobium ytterbium zirconium oxide (PbNb0.25Yb0.25Zr0.5O3) **250679-55-1P**, Lead niobium ytterbium zirconium oxide (PbNb0.34Yb0.34Zr0.33O3) **250679-56-2P**, Lead niobium ytterbium zirconium oxide (PbNb0.32Yb0.32Zr0.35O3) **250679-57-3P**, Lead niobium ytterbium zirconium oxide (PbNb0.32Yb0.32Zr0.37O3)
RL: PNU (Preparation, unclassified); PRP (Properties); PREP (Preparation)
(dielec. properties and x-ray study of Zr-substituted Pb(Yb1/2Nb1/2)O3 ceramics)

L20 ANSWER 21 OF 30 HCAPLUS COPYRIGHT 2006 ACS on STN
1999:563548 Document No. 131:305853 A study of the dielectric properties and diffuse phase transition of the (1-x)Pb(Yb1/2Nb1/2)O3-xPbZrO3 binary system. Im, Ki Vin; Kim, Jai-Hyun; Choo, Woong Kil (Department of Materials Science and Engineering, Korea Advanced Institute of Science and Technology, Taejon, S. Korea). Proceedings of the IEEE International Symposium on Applications of Ferroelectrics, 11th, Montreux, Switz., Aug. 24-27, 1998, 467-470. Editor(s): Colla, Enrico; Damjanovic, Dragan; Setter, Nava. Institute of Electrical and Electronics Engineers: New York, N. Y. (English) 1998. CODEN: 68BPAC.
AB The dielec. properties and the behavior of phase transition in the (1-x) Pb(Yb1/2Nb1/2)O3-x PbZrO3 ($0 \leq x \leq 0.6$) ceramic system have been investigated. For $0 \leq x \leq 0.3$, the phase transition is relatively sharp and the dielec. const. approx. follows the Curie-Weiss law above the transition temp. Beyond x=0.4, the temp. dependence of dielec. const. becomes broadened and

the transition temp. shifts toward the high temp. with an increase in the measuring frequency.

IT **184363-31-3P**, Lead niobium ytterbium zirconium oxide (PbNb0.45Yb0.45Zr0.1O3) **184363-44-8P**, Lead niobium ytterbium zirconium oxide (PbNb0.3Yb0.3Zr0.4O3) **184363-46-0P**, Lead niobium ytterbium zirconium oxide (PbNb0.35Yb0.35Zr0.3O3) **247042-82-6P**, Lead niobium ytterbium zirconium oxide (PbNb0.22Yb0.22Zr0.55O3) **247042-83-7P**, Lead niobium ytterbium zirconium oxide (PbNb0.28Yb0.28Zr0.45O3) **247042-84-8P**, Lead niobium ytterbium zirconium oxide (PbNb0.25Yb0.25Zr0.5O3)
RL: PEP (Physical, engineering or chemical process); PRP (Properties); SPN (Synthetic preparation); PREP (Preparation); PROC (Process)
(dielec. properties and diffuse phase transition of the (1-x)Pb(Yb1/2Nb1/2)O3-xPbZrO3 binary system)

RN 184363-31-3 HCAPLUS
CN Lead niobium ytterbium zirconium oxide (PbNb0.45Yb0.45Zr0.1O3) (9CI) (CA INDEX NAME)

Component	Ratio	Component Registry Number
O	3	17778-80-2
Zr	0.1	7440-67-7
Yb	0.45	7440-64-4
Nb	0.45	7440-03-1
Pb	1	7439-92-1

RN 184363-44-8 HCAPLUS
CN Lead niobium ytterbium zirconium oxide (PbNb0.3Yb0.3Zr0.4O3) (9CI) (CA INDEX NAME)

Component	Ratio	Component Registry Number
O	3	17778-80-2
Zr	0.4	7440-67-7
Yb	0.3	7440-64-4
Nb	0.3	7440-03-1
Pb	1	7439-92-1

RN 184363-46-0 HCAPLUS
CN Lead niobium ytterbium zirconium oxide (PbNb0.35Yb0.35Zr0.3O3) (9CI) (CA INDEX NAME)

Component	Ratio	Component Registry Number
O	3	17778-80-2
Zr	0.3	7440-67-7
Yb	0.35	7440-64-4

Nb	0.35	7440-03-1
Pb	1	7439-92-1

RN 247042-82-6 HCAPLUS
CN Lead niobium ytterbium zirconium oxide (PbNb0.22Yb0.22Zr0.55O3) (9CI) (CA INDEX NAME)

Component	Ratio	Component Registry Number
O	3	17778-80-2
Zr	0.55	7440-67-7
Yb	0.22	7440-64-4
Nb	0.22	7440-03-1
Pb	1	7439-92-1

RN 247042-83-7 HCAPLUS
CN Lead niobium ytterbium zirconium oxide (PbNb0.28Yb0.28Zr0.45O3) (9CI) (CA INDEX NAME)

Component	Ratio	Component Registry Number
O	3	17778-80-2
Zr	0.45	7440-67-7
Yb	0.28	7440-64-4
Nb	0.28	7440-03-1
Pb	1	7439-92-1

RN 247042-84-8 HCAPLUS
CN Lead niobium ytterbium zirconium oxide (PbNb0.25Yb0.25Zr0.5O3) (9CI) (CA INDEX NAME)

Component	Ratio	Component Registry Number
O	3	17778-80-2
Zr	0.5	7440-67-7
Yb	0.25	7440-64-4
Nb	0.25	7440-03-1
Pb	1	7439-92-1

CC 76-8 (Electric Phenomena)
Section cross-reference(s): 57, 75
ST lead ytterbate niobate zirconate **ferroelec** ceramic phase transition
IT **Ferroelectric** materials
(ceramic; dielec. properties and diffuse phase transition of the (1-x)Pb(Yb1/2Nb1/2)O3-xPbZrO3 binary system)
IT Calcination
Curie-Weiss law
Dielectric constant

Ferroelectric transition
Sintering
(dielec. properties and diffuse phase transition of the (1-x)Pb(Yb1/2Nb1/2)O3-xPbZrO3 binary system)

IT **184363-31-3P**, Lead niobium ytterbium zirconium oxide (PbNb0.45Yb0.45Zr0.1O3) **184363-44-8P**, Lead niobium ytterbium zirconium oxide (PbNb0.3Yb0.3Zr0.4O3) **184363-46-0P**, Lead niobium ytterbium zirconium oxide (PbNb0.35Yb0.35Zr0.3O3) **247042-82-6P**, Lead niobium ytterbium zirconium oxide (PbNb0.22Yb0.22Zr0.55O3) **247042-83-7P**, Lead niobium ytterbium zirconium oxide (PbNb0.28Yb0.28Zr0.45O3) **247042-84-8P**, Lead niobium ytterbium zirconium oxide (PbNb0.25Yb0.25Zr0.5O3)
RL: PEP (Physical, engineering or chemical process); PRP (Properties); SPN (Synthetic preparation); PREP (Preparation); PROC (Process)
(dielec. properties and diffuse phase transition of the (1-x)Pb(Yb1/2Nb1/2)O3-xPbZrO3 binary system)

L20 ANSWER 22 OF 30 HCAPLUS COPYRIGHT 2006 ACS on STN
1999:377221 Document No. 131:135207 Structure and physical properties of a number of new binary systems (1-x)Pb(B3+1/2Nb1/2)O3-x-PbTiO3. Shternberg, A.; Shebanovs, L.; Yamashita, J.; Antonova, M.; Livin'sh, M.; Shorubalko, I. (Inst. Fiz. Tverd. Tela, Latv. Gos. Univ., Latvia). Kristallografiya, 44(1), 40-48 (Russian) 1999. CODEN: KRISAJ. ISSN: 0023-4761. Publisher: MAIK Nauka/Interperiodica Publishing.

AB By thermochem. reaction in the solid phase (1-x)Pb(Lu1/2Nb1/2)O3-xPbTiO3 and (1-x)Pb(Er1/2Nb1/2)O3-xPbTiO3 solid solns. were obtained, their phase diagrams were detd. at room temp., and a series of basic electrophys. parameters were detd. as a function of temp. Pb(Er1/2Nb1/2)O3 can be described as pseudo-monoclinic (actual symmetry orthorhombic space group Bmm2), with a = b 4.2161, c 4.0869 Å, and β 90.55°. The compd. is an antiferroelec. with phase transition to paraelec. phase at 305°. The corresponding solid soln. system has a morphotropic region at x = 0.4-0.6. For the (1-x)Pb(Lu1/2Nb1/2)O3-xPbTiO3 solid soln., the structure changes from pseudo-monoclinic (x <0.38) through pseudo-cubic (x ≈ 0.2) to tetragonal P4mm (x >0.49). The morphotropic region comprises x = 0.38-0.41. At the boundary of the morphotropic region x ≈ 0.41 the solid soln. has the max. value of the electromech. coupling coeffs.: kp = 0.66, kt = 0.48, and k31 = 0.35.

IT **233686-03-8**, Erbium lead niobium titanium oxide (Er0-0.5PbNb0-0.5Ti0-1O3)
RL: PRP (Properties)
(structural and elec. properties of)

RN 233686-03-8 HCAPLUS
CN Erbium lead niobium titanium oxide (Er0-0.5PbNb0-0.5Ti0-1O3) (9CI) (CA INDEX NAME)

Component	Ratio	Component

		Registry Number
O	3	17778-80-2
Er	0 - 0.5	7440-52-0
Ti	0 - 1	7440-32-6
Nb	0 - 0.5	7440-03-1
Pb	1	7439-92-1

IT **233685-93-3**, Erbium lead niobium titanium oxide (Er0.45PbNb0.45Ti0.1O3) **233685-94-4**, Erbium lead niobium titanium oxide (Er0.4PbNb0.4Ti0.2O3) **233685-95-5**, Erbium lead niobium titanium oxide (Er0.35PbNb0.35Ti0.3O3) **233685-96-6**, Erbium lead niobium titanium oxide (Er0.32PbNb0.32Ti0.36O3) **233685-97-7**, Erbium lead niobium titanium oxide (Er0.3PbNb0.3Ti0.4O3) **233685-98-8**, Erbium lead niobium titanium oxide (Er0.3PbNb0.3Ti0.41O3) **233685-99-9**, Erbium lead niobium titanium oxide (Er0.25PbNb0.25Ti0.5O3) **233686-00-5**, Erbium lead niobium titanium oxide (Er0.2PbNb0.2Ti0.6O3) **233686-01-6**, Erbium lead niobium titanium oxide (Er0.15PbNb0.15Ti0.7O3) **233686-02-7**, Erbium lead niobium titanium oxide (Er0.1PbNb0.1Ti0.8O3)
RL: PRP (Properties)
(structural and electrophys. properties of)
RN 233685-93-3 HCAPLUS
CN Erbium lead niobium titanium oxide (Er0.45PbNb0.45Ti0.1O3) (9CI) (CA INDEX NAME)

Component	Ratio	Component Registry Number
O	3	17778-80-2
Er	0.45	7440-52-0
Ti	0.1	7440-32-6
Nb	0.45	7440-03-1
Pb	1	7439-92-1

RN 233685-94-4 HCAPLUS
CN Erbium lead niobium titanium oxide (Er0.4PbNb0.4Ti0.2O3) (9CI) (CA INDEX NAME)

Component	Ratio	Component Registry Number
O	3	17778-80-2
Er	0.4	7440-52-0
Ti	0.2	7440-32-6
Nb	0.4	7440-03-1
Pb	1	7439-92-1

RN 233685-95-5 HCAPLUS
CN Erbium lead niobium titanium oxide (Er0.35PbNb0.35Ti0.3O3) (9CI)

(CA INDEX NAME)

Component	Ratio	Component Registry Number
O	3	17778-80-2
Er	0.35	7440-52-0
Ti	0.3	7440-32-6
Nb	0.35	7440-03-1
Pb	1	7439-92-1

RN 233685-96-6 HCAPLUS
CN Erbium lead niobium titanium oxide (Er0.32PbNb0.32Ti0.36O3) (9CI) (CA INDEX NAME)

Component	Ratio	Component Registry Number
O	3	17778-80-2
Er	0.32	7440-52-0
Ti	0.36	7440-32-6
Nb	0.32	7440-03-1
Pb	1	7439-92-1

RN 233685-97-7 HCAPLUS
CN Erbium lead niobium titanium oxide (Er0.3PbNb0.3Ti0.4O3) (9CI) (CA INDEX NAME)

Component	Ratio	Component Registry Number
O	3	17778-80-2
Er	0.3	7440-52-0
Ti	0.4	7440-32-6
Nb	0.3	7440-03-1
Pb	1	7439-92-1

RN 233685-98-8 HCAPLUS
CN Erbium lead niobium titanium oxide (Er0.3PbNb0.3Ti0.41O3) (9CI) (CA INDEX NAME)

Component	Ratio	Component Registry Number
O	3	17778-80-2
Er	0.3	7440-52-0
Ti	0.41	7440-32-6
Nb	0.3	7440-03-1
Pb	1	7439-92-1

RN 233685-99-9 HCAPLUS
CN Erbium lead niobium titanium oxide (Er0.25PbNb0.25Ti0.5O3) (9CI)

(CA INDEX NAME)

Component	Ratio	Component Registry Number
O	3	17778-80-2
Er	0.25	7440-52-0
Ti	0.5	7440-32-6
Nb	0.25	7440-03-1
Pb	1	7439-92-1

RN 233686-00-5 HCAPLUS
CN Erbium lead niobium titanium oxide (Er0.2PbNb0.2Ti0.6O3) (9CI) (CA INDEX NAME)

Component	Ratio	Component Registry Number
O	3	17778-80-2
Er	0.2	7440-52-0
Ti	0.6	7440-32-6
Nb	0.2	7440-03-1
Pb	1	7439-92-1

RN 233686-01-6 HCAPLUS
CN Erbium lead niobium titanium oxide (Er0.15PbNb0.15Ti0.7O3) (9CI) (CA INDEX NAME)

Component	Ratio	Component Registry Number
O	3	17778-80-2
Er	0.15	7440-52-0
Ti	0.7	7440-32-6
Nb	0.15	7440-03-1
Pb	1	7439-92-1

RN 233686-02-7 HCAPLUS
CN Erbium lead niobium titanium oxide (Er0.1PbNb0.1Ti0.8O3) (9CI) (CA INDEX NAME)

Component	Ratio	Component Registry Number
O	3	17778-80-2
Er	0.1	7440-52-0
Ti	0.8	7440-32-6
Nb	0.1	7440-03-1
Pb	1	7439-92-1

CC 68-1 (Phase Equilibriums, Chemical Equilibriums, and Solutions)
Section cross-reference(s): 75, 76, 78

IT **Ferroelectric** transition
(antiferroelec.; of erbium lead niobate)
IT **233686-03-8**, Erbium lead niobium titanium oxide (Er0-0.5PbNb0-0.5Ti0-1O3)
RL: PRP (Properties)
(structural and elec. properties of)
IT **233685-93-3**, Erbium lead niobium titanium oxide (Er0.45PbNb0.45Ti0.1O3) **233685-94-4**, Erbium lead niobium titanium oxide (Er0.4PbNb0.4Ti0.2O3) **233685-95-5**, Erbium lead niobium titanium oxide (Er0.35PbNb0.35Ti0.3O3) **233685-96-6**, Erbium lead niobium titanium oxide (Er0.32PbNb0.32Ti0.36O3) **233685-97-7**, Erbium lead niobium titanium oxide (Er0.3PbNb0.3Ti0.4O3) **233685-98-8**, Erbium lead niobium titanium oxide (Er0.3PbNb0.3Ti0.41O3) **233685-99-9**, Erbium lead niobium titanium oxide (Er0.25PbNb0.25Ti0.5O3) **233686-00-5**, Erbium lead niobium titanium oxide (Er0.2PbNb0.2Ti0.6O3) **233686-01-6**, Erbium lead niobium titanium oxide (Er0.15PbNb0.15Ti0.7O3) **233686-02-7**, Erbium lead niobium titanium oxide (Er0.1PbNb0.1Ti0.8O3)
RL: PRP (Properties)
(structural and electrophys. properties of)

L20 ANSWER 23 OF 30 HCAPLUS COPYRIGHT 2006 ACS on STN
1997:310498 Document No. 127:11892 **Ferroelectric** and crystallographic properties of Pb(Yb1/2Nb1/2)O3-PbTiO3 solid solution system. Yamamoto, Takashi; Ohashi, Satoru; Hisano, Kumao (Department Electrical Engineering, National Defense Academy, Yokosuka, 239, Japan). Ferroelectrics, 196(1-4), 281-284 (English) 1997. CODEN: FEROA8. ISSN: 0015-0193. Publisher: Gordon & Breach.
AB (1-X)Pb(Yb1/2Nb)O3-(x)PbTiO3, x = 0-0.8 solid solns. were investigated from the viewpoint of **ferroelec.** and crystallog. properties. With increasing PbTiO3 content (x), phases at room temp. successively changed from antiferroelec. (x = 0) to **ferroelec.** (x = 0.05-0.15), relaxor (x = 0.2-0.5), and again to **ferroelec.** (x > 0.5). Dielec. properties are discussed with order-disorder transformation as a function of PbTiO3 content x.
IT **170965-35-2**, Lead niobium titanium ytterbium oxide (PbNb0.45Ti0.1Yb0.45O3) **170965-38-5**, Lead niobium titanium ytterbium oxide (PbNb0.4Ti0.2Yb0.4O3) **170965-39-6**, Lead niobium titanium ytterbium oxide (PbNb0.35Ti0.3Yb0.35O3) **170965-40-9**, Lead niobium titanium ytterbium oxide (PbNb0.3Ti0.4Yb0.3O3) **170965-44-3**, Lead niobium titanium ytterbium oxide (PbNb0.25Ti0.5Yb0.25O3) **170965-48-7**, Lead niobium titanium ytterbium oxide (PbNb0.2Ti0.6Yb0.2O3) **170965-49-8**, Lead niobium titanium ytterbium oxide (PbNb0.1Ti0.8Yb0.1O3)
RL: PEP (Physical, engineering or chemical process); PRP (Properties); PROC (Process)
(**ferroelec.** and order-disorder transitions of the Pb(Yb1/2Nb1/2)O3-PbTiO3 solid soln. system)

RN 170965-35-2 HCAPLUS
CN Lead niobium titanium ytterbium oxide (PbNb0.45Ti0.1Yb0.4503) (9CI) (CA INDEX NAME)

Component	Ratio	Component Registry Number
O	3	17778-80-2
Yb	0.45	7440-64-4
Ti	0.1	7440-32-6
Nb	0.45	7440-03-1
Pb	1	7439-92-1

RN 170965-38-5 HCAPLUS
CN Lead niobium titanium ytterbium oxide (PbNb0.4Ti0.2Yb0.403) (9CI) (CA INDEX NAME)

Component	Ratio	Component Registry Number
O	3	17778-80-2
Yb	0.4	7440-64-4
Ti	0.2	7440-32-6
Nb	0.4	7440-03-1
Pb	1	7439-92-1

RN 170965-39-6 HCAPLUS
CN Lead niobium titanium ytterbium oxide (PbNb0.35Ti0.3Yb0.3503) (9CI) (CA INDEX NAME)

Component	Ratio	Component Registry Number
O	3	17778-80-2
Yb	0.35	7440-64-4
Ti	0.3	7440-32-6
Nb	0.35	7440-03-1
Pb	1	7439-92-1

RN 170965-40-9 HCAPLUS
CN Lead niobium titanium ytterbium oxide (PbNb0.3Ti0.4Yb0.303) (9CI) (CA INDEX NAME)

Component	Ratio	Component Registry Number
O	3	17778-80-2
Yb	0.3	7440-64-4
Ti	0.4	7440-32-6
Nb	0.3	7440-03-1
Pb	1	7439-92-1

RN 170965-44-3 HCAPLUS
CN Lead niobium titanium ytterbium oxide (PbNb0.25Ti0.5Yb0.25O3) (9CI) (CA INDEX NAME)

Component	Ratio	Component Registry Number
O	3	17778-80-2
Yb	0.25	7440-64-4
Ti	0.5	7440-32-6
Nb	0.25	7440-03-1
Pb	1	7439-92-1

RN 170965-48-7 HCAPLUS
CN Lead niobium titanium ytterbium oxide (PbNb0.2Ti0.6Yb0.2O3) (9CI) (CA INDEX NAME)

Component	Ratio	Component Registry Number
O	3	17778-80-2
Yb	0.2	7440-64-4
Ti	0.6	7440-32-6
Nb	0.2	7440-03-1
Pb	1	7439-92-1

RN 170965-49-8 HCAPLUS
CN Lead niobium titanium ytterbium oxide (PbNb0.1Ti0.8Yb0.1O3) (9CI) (CA INDEX NAME)

Component	Ratio	Component Registry Number
O	3	17778-80-2
Yb	0.1	7440-64-4
Ti	0.8	7440-32-6
Nb	0.1	7440-03-1
Pb	1	7439-92-1

IT **170965-34-1**, Lead niobium titanium ytterbium oxide (PbNb0.48Ti0.05Yb0.48O3)
RL: PEP (Physical, engineering or chemical process); PRP (Properties); PROC (Process)
(**ferroelec.** transitions and sp. heat of)
RN 170965-34-1 HCAPLUS
CN Lead niobium titanium ytterbium oxide (PbNb0.48Ti0.05Yb0.48O3) (9CI) (CA INDEX NAME)

Component	Ratio	Component Registry Number
O	3	17778-80-2

Yb	0.48	7440-64-4
Ti	0.05	7440-32-6
Nb	0.48	7440-03-1
Pb	1	7439-92-1

CC 76-8 (Electric Phenomena)
Section cross-reference(s): 69, 75
ST **ferroelec** transition lead ytterbium niobate titanate; order disorder lead ytterbium niobate titanate
IT Curie temperature (**ferroelectric**)
Dielectric constant
Ferroelectric transition
Heat capacity
Order-disorder transition
(of the Pb(Yb1/2Nb1/2)O3-PbTiO3 solid soln. system)
IT **170965-35-2**, Lead niobium titanium ytterbium oxide (PbNb0.45Ti0.1Yb0.45O3) **170965-38-5**, Lead niobium titanium ytterbium oxide (PbNb0.4Ti0.2Yb0.4O3) **170965-39-6**, Lead niobium titanium ytterbium oxide (PbNb0.35Ti0.3Yb0.35O3) **170965-40-9**, Lead niobium titanium ytterbium oxide (PbNb0.3Ti0.4Yb0.3O3) **170965-44-3**, Lead niobium titanium ytterbium oxide (PbNb0.25Ti0.5Yb0.25O3) **170965-48-7**, Lead niobium titanium ytterbium oxide (PbNb0.2Ti0.6Yb0.2O3) **170965-49-8**, Lead niobium titanium ytterbium oxide (PbNb0.1Ti0.8Yb0.1O3)
RL: PEP (Physical, engineering or chemical process); PRP (Properties); PROC (Process)
(**ferroelec.** and order-disorder transitions of the Pb(Yb1/2Nb1/2)O3-PbTiO3 solid soln. system)
IT **170965-34-1**, Lead niobium titanium ytterbium oxide (PbNb0.48Ti0.05Yb0.48O3)
RL: PEP (Physical, engineering or chemical process); PRP (Properties); PROC (Process)
(**ferroelec.** transitions and sp. heat of)

L20 ANSWER 24 OF 30 HCAPLUS COPYRIGHT 2006 ACS on STN
1996:631577 Document No. 125:312836 Structural phase transition in La-substituted Pb[(Yb1/2Nb1/2)0.88Ti0.12]O3 relaxor system. Im, Ki Vin; Choo, Woong Kil; Choo, Carolyn Kyoungshin Koh (Dep. Materials Eng., Korea Advanced Inst. Sci. Technol., Taejon, 305-701, S. Korea). Japanese Journal of Applied Physics, Part 1: Regular Papers, Short Notes & Review Papers, 35(9B), 5217-5219 (English) 1996. CODEN: JAPNDE. ISSN: 0021-4922. Publisher: Japanese Journal of Applied Physics.
AB The effect of substitution of La2O3 + Yb2O3 to the perovskite solid soln. near the compn. (PbYb1/2Nb1/2O3)0.88-(PbTiO3)0.12 in the chem. formula (1-x)[(PbYb1/2Nb1/2O3)0.88(PbTiO3)0.12]-xLaYbO3 was studied. When x = 0.0 and x = 0.01, these solid solns. have partially disordered pseudocubic structure and behave as a **ferroelec**. relaxor. For x ≥ 0.02, the character of phase transition changes from a **ferroelec.** relaxor type to an antiferroelec. one and the transition temp. surprisingly increases

with LaYbO3 addn. In this compn. range, the solid soln. displays a sharp antiferroelec. transition. The effect on the tendency toward antiferroelec. with increasing LaYbO3 content is displayed in restoring of the superlattice reflections due to antiferroelec. order. From the structural study of ceramic specimens having various PbTiO3 and LaYbO3 concns., a portion of the phase diagram of the pseudo-ternary PbYb1/2Nb1/2O3-PbTiO3-LaYbO3 system was constructed.

IT **183062-34-2**, Lead niobium titanium ytterbium oxide (PbNb0.44Ti0.12Yb0.44O3)
RL: PEP (Physical, engineering or chemical process); PRP (Properties); PROC (Process)
(crystal structure and phase transitions in)

RN 183062-34-2 HCAPLUS

CN Lead niobium titanium ytterbium oxide (PbNb0.44Ti0.12Yb0.44O3) (9CI) (CA INDEX NAME)

Component	Ratio	Component Registry Number
O	3	17778-80-2
Yb	0.44	7440-64-4
Ti	0.12	7440-32-6
Nb	0.44	7440-03-1
Pb	1	7439-92-1

CC 75-7 (Crystallography and Liquid Crystals)
Section cross-reference(s): 68, 76

ST lanthanum lead ytterbium niobate titanate structure; phase transition lanthanum lead ytterbium niobatetitanate; **ferroelec** transition lanthanum lead ytterbium niobatetitanate

IT **Ferroelectricity**
(anti-, transition in lead ytterbium niobate-lead titanate-lanthanum ytterbium oxide solid solns.)

IT **Ferroelectric** substances
(relaxor, crystal structure and structural transition in lead ytterbium niobate-lead titanate-lanthanum ytterbium oxide solid solns.)

IT **183062-34-2**, Lead niobium titanium ytterbium oxide (PbNb0.44Ti0.12Yb0.44O3) 183062-35-3 183062-37-5 183062-39-7 183062-41-1 183062-43-3 183062-45-5 183062-48-8
RL: PEP (Physical, engineering or chemical process); PRP (Properties); PROC (Process)
(crystal structure and phase transitions in)

L20 ANSWER 25 OF 30 HCAPLUS COPYRIGHT 2006 ACS on STN
1996:631551 Document No. 126:25573 **Ferroelectricity** and phase relations in the system Pb(Yb1/2Nb1/2)O3-PbZrO3. Yokosuka, Masaru; Imazeki, Ken-ichi (Fac. Sci. Eng., Iwaki-Meisei Univ., Fukushima, 970, Japan). Japanese Journal of Applied Physics, Part 1: Regular Papers, Short Notes & Review Papers, 35(9B), 5109-5112

(English) 1996. CODEN: JAPNDE. ISSN: 0021-4922. Publisher: Japanese Journal of Applied Physics.

AB The phase diagram was detd. for the entire compn. range or the system Pb(Yb1/2Nb1/2)O3-PbZrO3. Despite the fact that both end members Pb(Yb1/2Nb1/2)O3 and PbZrO3 are antiferroelec., a **ferroelec.** phase appears for a narrow compn. range, and its nature is briefly discussed. The phase diagram consists of the three phases: paraelec. (PE) cubic, **ferroelec.** (FE) tetragonal and antiferroelec. (ARE) orthorhombic. An insol. region is obsd.

IT **184363-29-9**, Lead niobium ytterbium zirconium oxide (PbNb0.1Yb0.1Zr0.8O3) **184363-31-3**, Lead niobium ytterbium zirconium oxide (PbNb0.45Yb0.45Zr0.1O3) **184363-33-5**, Lead niobium ytterbium zirconium oxide (PbNb0.16Yb0.16Zr0.68O3) **184363-35-7**, Lead niobium ytterbium zirconium oxide (PbNb0.05Yb0.05Zr0.9O3) **184363-38-0**, Lead niobium ytterbium zirconium oxide (PbNb0.15Yb0.15Zr0.7O3) **184363-40-4**, Lead niobium ytterbium zirconium oxide (PbNb0.18Yb0.18Zr0.65O3) **184363-42-6**, Lead niobium ytterbium zirconium oxide (PbNb0.2Yb0.2Zr0.6O3) **184363-44-8**, Lead niobium ytterbium zirconium oxide (PbNb0.3Yb0.3Zr0.4O3) **184363-46-0**, Lead niobium ytterbium zirconium oxide (PbNb0.35Yb0.35Zr0.3O3) **184363-48-2**, Lead niobium ytterbium zirconium oxide (PbNb0.4Yb0.4Zr0.2O3) **184363-50-6**, Lead niobium ytterbium zirconium oxide (PbNb0.11Yb0.11Zr0.78O3) **184363-52-8**, Lead niobium ytterbium zirconium oxide (PbNb0.12Yb0.12Zr0.75O3) **184363-54-0**, Lead niobium ytterbium zirconium oxide (PbNb0.14Yb0.14Zr0.72O3) **184363-56-2**, Lead niobium ytterbium zirconium oxide (PbNb0.19Yb0.19Zr0.62O3)
RL: PRP (Properties)
(**ferroelectricity** of)

RN 184363-29-9 HCAPLUS

CN Lead niobium ytterbium zirconium oxide (PbNb0.1Yb0.1Zr0.8O3) (9CI) (CA INDEX NAME)

Component	Ratio	Component Registry Number
O	3	17778-80-2
Zr	0.8	7440-67-7
Yb	0.1	7440-64-4
Nb	0.1	7440-03-1
Pb	1	7439-92-1

RN 184363-31-3 HCAPLUS

CN Lead niobium ytterbium zirconium oxide (PbNb0.45Yb0.45Zr0.1O3) (9CI) (CA INDEX NAME)

Component	Ratio	Component Registry Number

O	3	17778-80-2
Zr	0.1	7440-67-7
Yb	0.45	7440-64-4
Nb	0.45	7440-03-1
Pb	1	7439-92-1

RN 184363-33-5 HCAPLUS
CN Lead niobium ytterbium zirconium oxide (PbNb0.16Yb0.16Zr0.68O3) (9CI) (CA INDEX NAME)

Component	Ratio	Component Registry Number
O	3	17778-80-2
Zr	0.68	7440-67-7
Yb	0.16	7440-64-4
Nb	0.16	7440-03-1
Pb	1	7439-92-1

RN 184363-35-7 HCAPLUS
CN Lead niobium ytterbium zirconium oxide (PbNb0.05Yb0.05Zr0.9O3) (9CI) (CA INDEX NAME)

Component	Ratio	Component Registry Number
O	3	17778-80-2
Zr	0.9	7440-67-7
Yb	0.05	7440-64-4
Nb	0.05	7440-03-1
Pb	1	7439-92-1

RN 184363-38-0 HCAPLUS
CN Lead niobium ytterbium zirconium oxide (PbNb0.15Yb0.15Zr0.7O3) (9CI) (CA INDEX NAME)

Component	Ratio	Component Registry Number
O	3	17778-80-2
Zr	0.7	7440-67-7
Yb	0.15	7440-64-4
Nb	0.15	7440-03-1
Pb	1	7439-92-1

RN 184363-40-4 HCAPLUS
CN Lead niobium ytterbium zirconium oxide (PbNb0.18Yb0.18Zr0.65O3) (9CI) (CA INDEX NAME)

Component	Ratio	Component Registry Number

O	3	17778-80-2
Zr	0.65	7440-67-7
Yb	0.18	7440-64-4
Nb	0.18	7440-03-1
Pb	1	7439-92-1

RN 184363-42-6 HCAPLUS
CN Lead niobium ytterbium zirconium oxide (PbNb0.2Yb0.2Zr0.6O3) (9CI) (CA INDEX NAME)

Component	Ratio	Component Registry Number
O	3	17778-80-2
Zr	0.6	7440-67-7
Yb	0.2	7440-64-4
Nb	0.2	7440-03-1
Pb	1	7439-92-1

RN 184363-44-8 HCAPLUS
CN Lead niobium ytterbium zirconium oxide (PbNb0.3Yb0.3Zr0.4O3) (9CI) (CA INDEX NAME)

Component	Ratio	Component Registry Number
O	3	17778-80-2
Zr	0.4	7440-67-7
Yb	0.3	7440-64-4
Nb	0.3	7440-03-1
Pb	1	7439-92-1

RN 184363-46-0 HCAPLUS
CN Lead niobium ytterbium zirconium oxide (PbNb0.35Yb0.35Zr0.3O3) (9CI) (CA INDEX NAME)

Component	Ratio	Component Registry Number
O	3	17778-80-2
Zr	0.3	7440-67-7
Yb	0.35	7440-64-4
Nb	0.35	7440-03-1
Pb	1	7439-92-1

RN 184363-48-2 HCAPLUS
CN Lead niobium ytterbium zirconium oxide (PbNb0.4Yb0.4Zr0.2O3) (9CI) (CA INDEX NAME)

Component	Ratio	Component Registry Number

O	3	17778-80-2
Zr	0.2	7440-67-7
Yb	0.4	7440-64-4
Nb	0.4	7440-03-1
Pb	1	7439-92-1

RN 184363-50-6 HCAPLUS
CN Lead niobium ytterbium zirconium oxide (PbNb0.11Yb0.11Zr0.78O3) (9CI) (CA INDEX NAME)

Component	Ratio	Component Registry Number
O	3	17778-80-2
Zr	0.78	7440-67-7
Yb	0.11	7440-64-4
Nb	0.11	7440-03-1
Pb	1	7439-92-1

RN 184363-52-8 HCAPLUS
CN Lead niobium ytterbium zirconium oxide (PbNb0.12Yb0.12Zr0.75O3) (9CI) (CA INDEX NAME)

Component	Ratio	Component Registry Number
O	3	17778-80-2
Zr	0.75	7440-67-7
Yb	0.12	7440-64-4
Nb	0.12	7440-03-1
Pb	1	7439-92-1

RN 184363-54-0 HCAPLUS
CN Lead niobium ytterbium zirconium oxide (PbNb0.14Yb0.14Zr0.72O3) (9CI) (CA INDEX NAME)

Component	Ratio	Component Registry Number
O	3	17778-80-2
Zr	0.72	7440-67-7
Yb	0.14	7440-64-4
Nb	0.14	7440-03-1
Pb	1	7439-92-1

RN 184363-56-2 HCAPLUS
CN Lead niobium ytterbium zirconium oxide (PbNb0.19Yb0.19Zr0.62O3) (9CI) (CA INDEX NAME)

Component	Ratio	Component Registry Number

O	3	17778-80-2
Zr	0.62	7440-67-7
Yb	0.19	7440-64-4
Nb	0.19	7440-03-1
Pb	1	7439-92-1

CC 76-8 (Electric Phenomena)
Section cross-reference(s): 57, 68
ST lead niobate ytterbate zirconate **ferroelectricity**; phase diagram lead niobate ytterbate zirconate
IT Dielectric constant
Ferroelectricity
Piezoelectricity
(of lead niobate ytterbate zirconate)
IT **184363-29-9**, Lead niobium ytterbium zirconium oxide (PbNb0.1Yb0.1Zr0.8O3) **184363-31-3**, Lead niobium ytterbium zirconium oxide (PbNb0.45Yb0.45Zr0.1O3) **184363-33-5**, Lead niobium ytterbium zirconium oxide (PbNb0.16Yb0.16Zr0.68O3) **184363-35-7**, Lead niobium ytterbium zirconium oxide (PbNb0.05Yb0.05Zr0.9O3) **184363-38-0**, Lead niobium ytterbium zirconium oxide (PbNb0.15Yb0.15Zr0.7O3) **184363-40-4**, Lead niobium ytterbium zirconium oxide (PbNb0.18Yb0.18Zr0.65O3) **184363-42-6**, Lead niobium ytterbium zirconium oxide (PbNb0.2Yb0.2Zr0.6O3) **184363-44-8**, Lead niobium ytterbium zirconium oxide (PbNb0.3Yb0.3Zr0.4O3) **184363-46-0**, Lead niobium ytterbium zirconium oxide (PbNb0.35Yb0.35Zr0.3O3) **184363-48-2**, Lead niobium ytterbium zirconium oxide (PbNb0.4Yb0.4Zr0.2O3) **184363-50-6**, Lead niobium ytterbium zirconium oxide (PbNb0.11Yb0.11Zr0.78O3) **184363-52-8**, Lead niobium ytterbium zirconium oxide (PbNb0.12Yb0.12Zr0.75O3) **184363-54-0**, Lead niobium ytterbium zirconium oxide (PbNb0.14Yb0.14Zr0.72O3) **184363-56-2**, Lead niobium ytterbium zirconium oxide (PbNb0.19Yb0.19Zr0.62O3)
RL: PRP (Properties)
(**ferroelectricity** of)

L20 ANSWER 26 OF 30 HCAPLUS COPYRIGHT 2006 ACS on STN
1995:877773 Document No. 123:356375 Dielectric and piezoelectric properties of Pb(Yb1/2Nb1/2)O3-PbTiO3 solid solution system. Yamamoto, Takashi; Ohashi, Satoru (Department of Electrical Engineering, The National Defense Academy, Yokosuka, 239, Japan). Japanese Journal of Applied Physics, Part 1: Regular Papers, Short Notes & Review Papers, 34(9B), 5349-53 (English) 1995. CODEN: JAPNDE. ISSN: 0021-4922. Publisher: Japanese Journal of Applied Physics.
AB Solid solns. of (1-x)Pb(Yb1/2Nb1/2)O3-(x)PbTiO3 x = 0 to 0.8 were studied from the viewpoint of dielec. and piezoelec. properties. With increasing PbTiO3 content (x), phases at room temp. continuously changed from antiferroelec. (x = 0), **ferroelec**. (x = 0.1 to 0.15), relaxor (x = 0.2 to 0.49), and again to **ferroelec.** (x > 0.49), where crystal structures of all these

phases were perovskite. Sintering temp. was lowered to around 950° in the relaxor phase (x = 0.2 to 0.49). Piezoelec. const. exhibited a max. at x = 0.49 to 0.50 near the morphotropic phase boundary (x = 0.49). In the sample with x = 0.50, Curie point was 349°, and remanent polarization and coercive field were 32.8 μC/cm2 and 2.75 kV/mm, resp.

IT **170965-34-1**, Lead niobium titanium ytterbium oxide (PbNb0.48Ti0.05Yb0.4803) **170965-35-2**, Lead niobium titanium ytterbium oxide (PbNb0.45Ti0.1Yb0.4503) **170965-36-3**, Lead niobium titanium ytterbium oxide (PbNb0.42Ti0.15Yb0.4203) **170965-37-4**, Lead niobium titanium ytterbium oxide (PbNb0.41Ti0.18Yb0.4103) **170965-38-5**, Lead niobium titanium ytterbium oxide (PbNb0.4Ti0.2Yb0.403) **170965-39-6**, Lead niobium titanium ytterbium oxide (PbNb0.35Ti0.3Yb0.3503) **170965-40-9**, Lead niobium titanium ytterbium oxide (PbNb0.3Ti0.4Yb0.303) **170965-41-0**, Lead niobium titanium ytterbium oxide (PbNb0.28Ti0.45Yb0.2803) **170965-42-1**, Lead niobium titanium ytterbium oxide (PbNb0.26Ti0.48Yb0.2603) **170965-43-2**, Lead niobium titanium ytterbium oxide (PbNb0.26Ti0.49Yb0.2603) **170965-44-3**, Lead niobium titanium ytterbium oxide (PbNb0.25Ti0.5Yb0.2503) **170965-45-4**, Lead niobium titanium ytterbium oxide (PbNb0.24Ti0.51Yb0.2403) **170965-46-5**, Lead niobium titanium ytterbium oxide (PbNb0.24Ti0.52Yb0.2403) **170965-47-6**, Lead niobium titanium ytterbium oxide (PbNb0.22Ti0.55Yb0.2203) **170965-48-7**, Lead niobium titanium ytterbium oxide (PbNb0.2Ti0.6Yb0.203) **170965-49-8**, Lead niobium titanium ytterbium oxide (PbNb0.1Ti0.8Yb0.103)

RL: PRP (Properties)
(dielec. and piezoelec. properties of Pb(Yb1/2Nb1/2)O3-PbTiO3 solid soln. system)

RN 170965-34-1 HCAPLUS

CN Lead niobium titanium ytterbium oxide (PbNb0.48Ti0.05Yb0.4803) (9CI) (CA INDEX NAME)

Component	Ratio	Component Registry Number
O	3	17778-80-2
Yb	0.48	7440-64-4
Ti	0.05	7440-32-6
Nb	0.48	7440-03-1
Pb	1	7439-92-1

RN 170965-35-2 HCAPLUS

CN Lead niobium titanium ytterbium oxide (PbNb0.45Ti0.1Yb0.4503) (9CI) (CA INDEX NAME)

Component	Ratio	Component Registry Number
O	3	17778-80-2

Yb	0.45	7440-64-4
Ti	0.1	7440-32-6
Nb	0.45	7440-03-1
Pb	1	7439-92-1

RN 170965-36-3 HCAPLUS
CN Lead niobium titanium ytterbium oxide (PbNb0.42Ti0.15Yb0.42O3) (9CI) (CA INDEX NAME)

Component	Ratio	Component Registry Number
O	3	17778-80-2
Yb	0.42	7440-64-4
Ti	0.15	7440-32-6
Nb	0.42	7440-03-1
Pb	1	7439-92-1

RN 170965-37-4 HCAPLUS
CN Lead niobium titanium ytterbium oxide (PbNb0.41Ti0.18Yb0.41O3) (9CI) (CA INDEX NAME)

Component	Ratio	Component Registry Number
O	3	17778-80-2
Yb	0.41	7440-64-4
Ti	0.18	7440-32-6
Nb	0.41	7440-03-1
Pb	1	7439-92-1

RN 170965-38-5 HCAPLUS
CN Lead niobium titanium ytterbium oxide (PbNb0.4Ti0.2Yb0.4O3) (9CI) (CA INDEX NAME)

Component	Ratio	Component Registry Number
O	3	17778-80-2
Yb	0.4	7440-64-4
Ti	0.2	7440-32-6
Nb	0.4	7440-03-1
Pb	1	7439-92-1

RN 170965-39-6 HCAPLUS
CN Lead niobium titanium ytterbium oxide (PbNb0.35Ti0.3Yb0.35O3) (9CI) (CA INDEX NAME)

Component	Ratio	Component Registry Number
O	3	17778-80-2

Yb	0.35	7440-64-4
Ti	0.3	7440-32-6
Nb	0.35	7440-03-1
Pb	1	7439-92-1

RN 170965-40-9 HCAPLUS
CN Lead niobium titanium ytterbium oxide (PbNb0.3Ti0.4Yb0.3O3) (9CI) (CA INDEX NAME)

Component	Ratio	Component Registry Number
O	3	17778-80-2
Yb	0.3	7440-64-4
Ti	0.4	7440-32-6
Nb	0.3	7440-03-1
Pb	1	7439-92-1

RN 170965-41-0 HCAPLUS
CN Lead niobium titanium ytterbium oxide (PbNb0.28Ti0.45Yb0.28O3) (9CI) (CA INDEX NAME)

Component	Ratio	Component Registry Number
O	3	17778-80-2
Yb	0.28	7440-64-4
Ti	0.45	7440-32-6
Nb	0.28	7440-03-1
Pb	1	7439-92-1

RN 170965-42-1 HCAPLUS
CN Lead niobium titanium ytterbium oxide (PbNb0.26Ti0.48Yb0.26O3) (9CI) (CA INDEX NAME)

Component	Ratio	Component Registry Number
O	3	17778-80-2
Yb	0.26	7440-64-4
Ti	0.48	7440-32-6
Nb	0.26	7440-03-1
Pb	1	7439-92-1

RN 170965-43-2 HCAPLUS
CN Lead niobium titanium ytterbium oxide (PbNb0.26Ti0.49Yb0.26O3) (9CI) (CA INDEX NAME)

Component	Ratio	Component Registry Number
O	3	17778-80-2

Yb	0.26	7440-64-4
Ti	0.49	7440-32-6
Nb	0.26	7440-03-1
Pb	1	7439-92-1

RN 170965-44-3 HCAPLUS
CN Lead niobium titanium ytterbium oxide (PbNb0.25Ti0.5Yb0.25O3) (9CI) (CA INDEX NAME)

Component	Ratio	Component Registry Number
O	3	17778-80-2
Yb	0.25	7440-64-4
Ti	0.5	7440-32-6
Nb	0.25	7440-03-1
Pb	1	7439-92-1

RN 170965-45-4 HCAPLUS
CN Lead niobium titanium ytterbium oxide (PbNb0.24Ti0.51Yb0.24O3) (9CI) (CA INDEX NAME)

Component	Ratio	Component Registry Number
O	3	17778-80-2
Yb	0.24	7440-64-4
Ti	0.51	7440-32-6
Nb	0.24	7440-03-1
Pb	1	7439-92-1

RN 170965-46-5 HCAPLUS
CN Lead niobium titanium ytterbium oxide (PbNb0.24Ti0.52Yb0.24O3) (9CI) (CA INDEX NAME)

Component	Ratio	Component Registry Number
O	3	17778-80-2
Yb	0.24	7440-64-4
Ti	0.52	7440-32-6
Nb	0.24	7440-03-1
Pb	1	7439-92-1

RN 170965-47-6 HCAPLUS
CN Lead niobium titanium ytterbium oxide (PbNb0.22Ti0.55Yb0.22O3) (9CI) (CA INDEX NAME)

Component	Ratio	Component Registry Number
O	3	17778-80-2

Yb	0.22	7440-64-4
Ti	0.55	7440-32-6
Nb	0.22	7440-03-1
Pb	1	7439-92-1

RN 170965-48-7 HCAPLUS
CN Lead niobium titanium ytterbium oxide (PbNb0.2Ti0.6Yb0.2O3) (9CI) (CA INDEX NAME)

Component	Ratio	Component Registry Number
O	3	17778-80-2
Yb	0.2	7440-64-4
Ti	0.6	7440-32-6
Nb	0.2	7440-03-1
Pb	1	7439-92-1

RN 170965-49-8 HCAPLUS
CN Lead niobium titanium ytterbium oxide (PbNb0.1Ti0.8Yb0.1O3) (9CI) (CA INDEX NAME)

Component	Ratio	Component Registry Number
O	3	17778-80-2
Yb	0.1	7440-64-4
Ti	0.8	7440-32-6
Nb	0.1	7440-03-1
Pb	1	7439-92-1

CC 76-9 (Electric Phenomena)
ST lead ytterbium niobate titanate dielec const; piezoelectricity dielec polarization oxide; Curie point **ferroelec** oxide
IT **Ferroelectricity**
(Curie point, dielec. and piezoelec. properties of Pb(Yb1/2Nb1/2)O3-PbTiO3 solid soln. system)
IT **Ferroelectricity**
(anti-, dielec. and piezoelec. properties of Pb(Yb1/2Nb1/2)O3-PbTiO3 solid soln. system)
IT 12034-65-0, Lead niobium ytterbium oxide (PbNb0.5Yb0.5O3) **170965-34-1**, Lead niobium titanium ytterbium oxide (PbNb0.48Ti0.05Yb0.48O3) **170965-35-2**, Lead niobium titanium ytterbium oxide (PbNb0.45Ti0.1Yb0.45O3) **170965-36-3**, Lead niobium titanium ytterbium oxide (PbNb0.42Ti0.15Yb0.42O3) **170965-37-4**, Lead niobium titanium ytterbium oxide (PbNb0.41Ti0.18Yb0.41O3) **170965-38-5**, Lead niobium titanium ytterbium oxide (PbNb0.4Ti0.2Yb0.4O3) **170965-39-6**, Lead niobium titanium ytterbium oxide (PbNb0.35Ti0.3Yb0.35O3) **170965-40-9**, Lead niobium titanium ytterbium oxide (PbNb0.3Ti0.4Yb0.3O3) **170965-41-0**, Lead niobium titanium ytterbium oxide (PbNb0.28Ti0.45Yb0.28O3) **170965-42-1**, Lead

niobium titanium ytterbium oxide (PbNb0.26Ti0.48Yb0.26O3) **170965-43-2**, Lead niobium titanium ytterbium oxide (PbNb0.26Ti0.49Yb0.26O3) **170965-44-3**, Lead niobium titanium ytterbium oxide (PbNb0.25Ti0.5Yb0.25O3) **170965-45-4**, Lead niobium titanium ytterbium oxide (PbNb0.24Ti0.51Yb0.24O3) **170965-46-5**, Lead niobium titanium ytterbium oxide (PbNb0.24Ti0.52Yb0.24O3) **170965-47-6**, Lead niobium titanium ytterbium oxide (PbNb0.22Ti0.55Yb0.22O3) **170965-48-7**, Lead niobium titanium ytterbium oxide (PbNb0.2Ti0.6Yb0.2O3) **170965-49-8**, Lead niobium titanium ytterbium oxide (PbNb0.1Ti0.8Yb0.1O3)
RL: PRP (Properties)
(dielec. and piezoelec. properties of Pb(Yb1/2Nb1/2)O3-PbTiO3 solid soln. system)

L20 ANSWER 27 OF 30 HCAPLUS COPYRIGHT 2006 ACS on STN
1994:643202 Document No. 121:243202 **Ferroelectricity** of solid solution Pb[(Yb1/2Nb1/2)1/3Zr2/3]O3. Yokosuka, Masaru (Iwaki-Meisei Univ., Iwaki, 970, Japan). Japanese Journal of Applied Physics, Part 2: Letters, 33(8A), L1100-L1102 (English) 1994. CODEN: JAPLD8. ISSN: 0021-4922.

AB Studies were conducted on the **ferroelec.** properties of Pb[(Yb1/2Nb1/2)1/3Zr2/3]O3 which is considered to be a solid soln. consisting of antiferroelec. compds., Pb(Yb1/2Nb1/2)O3 and PbZrO3, in the mole ratio of 1:2. The crystal structure was detd. to be perovskite type of tetragonal symmetry with lattice consts. αT = 4.158 Å and cT = 4.116 Å. The Curie temp. was found to be 150°. The remanent polarization, Pτ = 6.8 μC/cm2, and the electromech. coupling factor, k33 = 0.20, were obtained at room temp. Finally, the nature of the **ferroelectricity** of Pb[(Yb1/2Nb1/2)1/3Zr2/3]O3 was briefly discussed.

IT **158611-92-8**, Lead niobium ytterbium zirconium oxide (PbNb0.17Yb0.17Zr0.67O3)
RL: PEP (Physical, engineering or chemical process); PRP (Properties); PROC (Process)
(**ferroelectricity** of solid soln. of)

RN 158611-92-8 HCAPLUS

CN Lead niobium ytterbium zirconium oxide (PbNb0.17Yb0.17Zr0.67O3) (9CI) (CA INDEX NAME)

Component	Ratio	Component Registry Number
O	3	17778-80-2
Zr	0.67	7440-67-7
Yb	0.17	7440-64-4
Nb	0.17	7440-03-1
Pb	1	7439-92-1

CC 76-8 (Electric Phenomena)
Section cross-reference(s): 75

ST **ferroelectricity** lead niobium ytterbium zirconium oxide;

crystal structure niobate zirconate; dielec polarization remanent piezoelectricity oxide

IT Crystal structure
Dielectric polarization
Ferroelectricity
Piezoelectricity
(of solid soln. of lead niobium ytterbium zirconium oxide)

IT 12034-65-0, Lead niobium ytterbium oxide pbnb0.5yb0.5o3
12060-01-4, Lead zirconate pbzro3
RL: PRP (Properties)
(**ferroelectricity** of solid soln. contg.)

IT **158611-92-8**, Lead niobium ytterbium zirconium oxide (PbNb0.17Yb0.17Zr0.67O3)
RL: PEP (Physical, engineering or chemical process); PRP (Properties); PROC (Process)
(**ferroelectricity** of solid soln. of)

L20 ANSWER 28 OF 30 HCAPLUS COPYRIGHT 2006 ACS on STN

1977:114199 Document No. 86:114199 Basic physicochemical principles for the production of inorganic dielectrics for high-frequency ceramic capacitors. Lisker, K. E.; Mudrolyubova, L. P.; Rotenberg, B. A. (USSR). Sb. Ref. - Vses. Konf. "Fiz. Dielektr. Perspekt. Ee Razvit.", Meeting Date 1973, Volume 2, 45-6. Editor(s): Koikov, S. N.; Semushkin, G. B. Leningr. Politekh. Inst.: Leningr., USSR. (Russian) 1974. CODEN: 34RHA7.

AB Study of the dielec. properties of compds. of the type (A',A')(B',B')O7 showed that these compds. with pyrochlore structure had high dielec. consts. (ε) and large neg. temp. coeffs. of ε, whereas those with LiTa2O7-type structure had temp. coeffs. close to zero. High ε and low temp. coeffs. were obtained for compds. which are **ferroelecs.** with diffuse phase transitions. Low dielec. losses at radio frequencies can be obtained by prepg. the compds. by copptn. methods, which produced a more ordered structure.

IT **37347-35-6**
RL: PRP (Properties)
(dielec. properties of, as capacitor insulator)

RN 37347-35-6 HCAPLUS

CN Lead neodymium niobium titanium oxide (PbNdNbTiO7) (9CI) (CA INDEX NAME)

Component	Ratio	Component Registry Number
O	7	17778-80-2
Ti	1	7440-32-6
Nb	1	7440-03-1
Nd	1	7440-00-8
Pb	1	7439-92-1

CC 76-3 (Electric Phenomena)

IT 12031-47-9 12049-50-2 12658-80-9 12658-81-0 **37347-35-6**

57674-32-5 62228-77-7 62228-87-9 62228-90-4 62228-93-7
RL: PRP (Properties)
(dielec. properties of, as capacitor insulator)

L20 ANSWER 29 OF 30 HCAPLUS COPYRIGHT 2006 ACS on STN
1976:598949 Document No. 85:198949 Study of a tetrahedral cross section of compositions of the lead oxide-potassium fluoride-boron oxide-lead neodymium titanium niobium oxide (PbNdTiNbO7) system. Belyaev, I. N.; Evstifeev, E. N. (Rostov.-na-Donu Gos. Univ., Rostov-on-Don, USSR). Izvestiya Akademii Nauk SSSR, Neorganicheskie Materialy, 12(9), 1702-4 (Russian) 1976. CODEN: IVNMAW. ISSN: 0002-337X.
AB The dissoln. and growth of PbNdTiNbO7 (**ferroelec.** and piezoelec. material) in PbO-KF-B2O3 flux was studied by visual-polythermal and x-ray phase anal. methods at 680-1100°. Temps. and compns. of polymorphic transition and ternary invariant points are given. PbNdTiNbO7 can be prepd. in this flux at 700-900° (instead of solid phase reaction at 1000-1100°).
IT **37347-35-6**
RL: PEP (Physical, engineering or chemical process); PROC (Process)
(dissoln. of, in boron oxide-lead oxide-potassium fluoride flux)
RN 37347-35-6 HCAPLUS
CN Lead neodymium niobium titanium oxide (PbNdNbTiO7) (9CI) (CA INDEX NAME)

Component	Ratio	Component Registry Number
O	7	17778-80-2
Ti	1	7440-32-6
Nb	1	7440-03-1
Nd	1	7440-00-8
Pb	1	7439-92-1

CC 68-1 (Phase Equilibriums, Chemical Equilibriums, and Solutions)
Section cross-reference(s): 75, 76
IT **37347-35-6**
RL: PEP (Physical, engineering or chemical process); PROC (Process)
(dissoln. of, in boron oxide-lead oxide-potassium fluoride flux)

L20 ANSWER 30 OF 30 HCAPLUS COPYRIGHT 2006 ACS on STN
1975:540605 Document No. 83:140605 **Ferroelectric** properties of bismuth lead niobium zirconium oxide (PbBiZrNbO7) with pyrochlore type structure. Belyaev, I. N.; Fesenko, E. G.; Peresun'ko, A. F.; Cherner, Ya. E. (Rostov.-na-Donu Gos. Univ., Rostov-on-Don, USSR). Izvestiya Akademii Nauk SSSR, Seriya Fizicheskaya, 39(5), 1103-4 (Russian) 1975. CODEN: IANFAY. ISSN: 0367-6765.
AB PbBiTiNbO7 (I), PbDyTiNbO7 (II), and PbBiZrNbO7 (III) showed max. on the temp. dependences of permittivity and tan ε (ε is the dielec. loss angle). I, II, and III are positioned in the centers of concn. tetrahedrons corresponding to PbO-A2O3-BO2-Nb2O5

(A = Bi or Dy; B = Ti or Zr). The x-ray phase and thermal analyses and single-crystal investigations indicated that I, II and III are individual substances and not solid solns. based on simple pyrochlores or pyrochlore-like compns. All the substances have a cubic pyrochlore cell, only III shows a slight tetragonal distortion. Temps. of prepn. and sintering and the relevant x-ray and dielec. data are tabulated. The information allows one to consider III a **ferroelec.** material.

IT **56940-92-2**
RL: PRP (Properties)
(dielec. const. and loss of, temp. dependence of)

RN 56940-92-2 HCAPLUS

CN Dysprosium lead niobium titanium oxide (DyPbNbTiO7) (9CI) (CA INDEX NAME)

Component	Ratio	Component Registry Number
O	7	17778-80-2
Ti	1	7440-32-6
Nb	1	7440-03-1
Pb	1	7439-92-1
Dy	1	7429-91-6

CC 76-6 (Electric Phenomena)
Section cross-reference(s): 75

ST bismuth lead zirconium niobate **ferroelec**

IT **Ferroelectricity**
(of bismuth lead zirconium niobate)

IT 12654-65-8 56940-72-8 **56940-92-2**
RL: PRP (Properties)
(dielec. const. and loss of, temp. dependence of)

=> d l22 cbib abs hitstr hitind 1-10

L22 ANSWER 1 OF 10 HCAPLUS COPYRIGHT 2006 ACS on STN

2005:257797 Document No. 142:439701 Dielectric nonlinearity of Pb(Yb1/2Nb1/2)O3-PbTiO3 thin films with {100} and {111} crystallographic orientation. Gharb, N. Bassiri; Trolier-McKinstry, S. (Materials Research Institute and Materials Science and Engineering Department, The Pennsylvania State University, University Park, PA, 16802, USA). Journal of Applied Physics, 97(6), 064106/1-064106/7 (English) 2005. CODEN: JAPIAU. ISSN: 0021-8979. Publisher: American Institute of Physics.

AB The extrinsic contributions to the dielec. response of 0.5Pb(Yb1/2Nb1/2)O3-0.5PbTiO3 thin films with (100) or (111) crystallog. orientation were studied (all indexes are given in terms of the pseudocubic cell). Both the nonlinearity in the permittivity as well as the polarization hysteresis are described by the Rayleigh Law in subswitching conditions. (100) Oriented films show a slightly higher extrinsic contribution to their dielec. behavior

than (111) oriented films. For example, at 1 kHz and oscillation fields of 20 kV/cm, for (100) and (111) oriented films, resp., 25% and 21% of the relative dielec. const. is due to irreversible extrinsic contributions. The difference is attributed to the higher concn. of mobile interfaces in the (100) oriented thin films. For frequencies between 20 Hz and 200 kHz both the Rayleigh parameters dropped with frequency approx. logarithmically. The frequency dependent Rayleigh parameters were used to modify the Rayleigh Law to allow prediction of the dielec. properties in terms of both oscillation field and frequency.

IT **170965-44-3**, Lead niobium titanium ytterbium oxide (PbNb0.25Ti0.5Yb0.25O3)
RL: PRP (Properties)
(dielec. nonlinearity of Pb(Yb1/2Nb1/2)O3-PbTiO3 thin films with {100} and {111} crystallog. orientation)

RN 170965-44-3 HCAPLUS

CN Lead niobium titanium ytterbium oxide (PbNb0.25Ti0.5Yb0.25O3) (9CI) (CA INDEX NAME)

Component	Ratio	Component Registry Number
O	3	17778-80-2
Yb	0.25	7440-64-4
Ti	0.5	7440-32-6
Nb	0.25	7440-03-1
Pb	1	7439-92-1

CC 76-9 (Electric Phenomena)
Section cross-reference(s): 75

IT **170965-44-3**, Lead niobium titanium ytterbium oxide (PbNb0.25Ti0.5Yb0.25O3)
RL: PRP (Properties)
(dielec. nonlinearity of Pb(Yb1/2Nb1/2)O3-PbTiO3 thin films with {100} and {111} crystallog. orientation)

L22 ANSWER 2 OF 10 HCAPLUS COPYRIGHT 2006 ACS on STN

2000:263628 Document No. 133:33455 Structure and properties of hot-pressed Pb(Lu1/2Nb1/2)O3-PbTiO3 binary system ceramics. Antonova, M.; Shebanovs, L.; Livinsh, M.; Yamashita, J. Y.; Sternberg, A.; Shorubalko, I.; Spule, A. (Institute of Solid State Physics, University of Latvia, Riga, LV-1063, Latvia). Journal of Electroceramics, 4(1), 179-187 (English) 2000. CODEN: JOELFJ. ISSN: 1385-3449. Publisher: Kluwer Academic Publishers.

AB Solid soln. series of the (1-x)Pb(Lu1/2Nb1/2)O3-x PbTiO3 binary system ceramics (PLuNT) were synthesized and hot-pressed (temp. 950°C to 1130°C, pressure 25 MPa); its structure, dielec. and piezoelec. properties were studied. Pure lutetium niobate PLuN (x = 0) has a pronounced long-range order in the B-sublattice and an antiferroelec. to paraelec. phase transition at .apprx. 258°C. The phase structure of the PLuNT system, at room temp., changes from a pseudomonoclinic (psd-M, space group

Bmm2) to tetragonal (T, space group P4mm). The pseudomonoclinic phase extends over the $0 \leq x \leq 0.38$ interval within which the monoclinic angle β proceeds a min. near to 90° at χ .simeq. 0.2. The morphotropic region covers the interval x = 0.38-0.49, the concn. ratio psd-M:T .simeq. 1 (the morphotropic phase boundary-MPB) corresponds to x = 0.41. Within the morphotropic region, a rather strong distortion of the unit cell-(c/a-1) $\geq$ 0.02, $\beta \geq 90.37°$, characteristic of "hard" piezoelecs. is maintained. Dielec. dispersion and broadening of the phase transition, features typical to relaxors, are obsd. within the concn. interval of $0.1 \leq x \leq 0.3$. The highest electromech. coupling coeffs.: kp = 0.66, kt = 0.48, k31 = 0.34 of (1-x) PLuN - xPT ceramics are attained in compns. near the MPB at $x \approx 0.41$. Non-isovalent doping of PLuNT with La3+ in Pb sublattice shifts the MPB to lower values of x.

IT **263872-43-1**, Lead lutetium niobium titanium oxide (PbLu0.45Nb0.45Ti0.1O3) **263872-44-2**, Lead lutetium niobium titanium oxide (PbLu0.4Nb0.4Ti0.2O3) **273750-90-6**, Lead lutetium niobium titanium oxide (PbLu0.35Nb0.35Ti0.3O3) **273750-91-7**, Lead lutetium niobium titanium oxide (PbLu0.32Nb0.32Ti0.36O3) **273750-92-8**, Lead lutetium niobium titanium oxide (PbLu0.3Nb0.3Ti0.4O3) **273750-93-9**, Lead lutetium niobium titanium oxide (PbLu0.25Nb0.25Ti0.5O3) **273750-94-0**, Lead lutetium niobium titanium oxide (PbLu0.2Nb0.2Ti0.6O3) **273750-95-1**, Lead lutetium niobium titanium oxide (PbLu0.15Nb0.15Ti0.7O3) **273750-96-2**, Lead lutetium niobium titanium oxide (PbLu0.1Nb0.1Ti0.8O3)
RL: FMU (Formation, unclassified); PRP (Properties); FORM (Formation, nonpreparative)
(structure and properties of hot-pressed Pb(Lu1/2Nb1/2)O3-PbTiO3 binary system ceramics)

RN 263872-43-1 HCAPLUS
CN Lead lutetium niobium titanium oxide (PbLu0.45Nb0.45Ti0.1O3) (9CI) (CA INDEX NAME)

Component	Ratio	Component Registry Number
O	3	17778-80-2
Ti	0.1	7440-32-6
Nb	0.45	7440-03-1
Lu	0.45	7439-94-3
Pb	1	7439-92-1

RN 263872-44-2 HCAPLUS
CN Lead lutetium niobium titanium oxide (PbLu0.4Nb0.4Ti0.2O3) (9CI) (CA INDEX NAME)

Component	Ratio	Component Registry Number

O	3	17778-80-2
Ti	0.2	7440-32-6
Nb	0.4	7440-03-1
Lu	0.4	7439-94-3
Pb	1	7439-92-1

RN 273750-90-6 HCAPLUS
CN Lead lutetium niobium titanium oxide (PbLu0.35Nb0.35Ti0.3O3) (9CI) (CA INDEX NAME)

Component	Ratio	Component Registry Number
O	3	17778-80-2
Ti	0.3	7440-32-6
Nb	0.35	7440-03-1
Lu	0.35	7439-94-3
Pb	1	7439-92-1

RN 273750-91-7 HCAPLUS
CN Lead lutetium niobium titanium oxide (PbLu0.32Nb0.32Ti0.36O3) (9CI) (CA INDEX NAME)

Component	Ratio	Component Registry Number
O	3	17778-80-2
Ti	0.36	7440-32-6
Nb	0.32	7440-03-1
Lu	0.32	7439-94-3
Pb	1	7439-92-1

RN 273750-92-8 HCAPLUS
CN Lead lutetium niobium titanium oxide (PbLu0.3Nb0.3Ti0.4O3) (9CI) (CA INDEX NAME)

Component	Ratio	Component Registry Number
O	3	17778-80-2
Ti	0.4	7440-32-6
Nb	0.3	7440-03-1
Lu	0.3	7439-94-3
Pb	1	7439-92-1

RN 273750-93-9 HCAPLUS
CN Lead lutetium niobium titanium oxide (PbLu0.25Nb0.25Ti0.5O3) (9CI) (CA INDEX NAME)

Component	Ratio	Component Registry Number

O	3	17778-80-2
Ti	0.5	7440-32-6
Nb	0.25	7440-03-1
Lu	0.25	7439-94-3
Pb	1	7439-92-1

RN 273750-94-0 HCAPLUS
CN Lead lutetium niobium titanium oxide (PbLu0.2Nb0.2Ti0.6O3) (9CI) (CA INDEX NAME)

Component	Ratio	Component Registry Number
O	3	17778-80-2
Ti	0.6	7440-32-6
Nb	0.2	7440-03-1
Lu	0.2	7439-94-3
Pb	1	7439-92-1

RN 273750-95-1 HCAPLUS
CN Lead lutetium niobium titanium oxide (PbLu0.15Nb0.15Ti0.7O3) (9CI) (CA INDEX NAME)

Component	Ratio	Component Registry Number
O	3	17778-80-2
Ti	0.7	7440-32-6
Nb	0.15	7440-03-1
Lu	0.15	7439-94-3
Pb	1	7439-92-1

RN 273750-96-2 HCAPLUS
CN Lead lutetium niobium titanium oxide (PbLu0.1Nb0.1Ti0.8O3) (9CI) (CA INDEX NAME)

Component	Ratio	Component Registry Number
O	3	17778-80-2
Ti	0.8	7440-32-6
Nb	0.1	7440-03-1
Lu	0.1	7439-94-3
Pb	1	7439-92-1

CC 57-2 (Ceramics)
IT **263872-43-1**, Lead lutetium niobium titanium oxide (PbLu0.45Nb0.45Ti0.1O3) **263872-44-2**, Lead lutetium niobium titanium oxide (PbLu0.4Nb0.4Ti0.2O3) **273750-90-6**, Lead lutetium niobium titanium oxide (PbLu0.35Nb0.35Ti0.3O3) **273750-91-7**, Lead lutetium niobium titanium oxide (PbLu0.32Nb0.32Ti0.36O3) **273750-92-8**, Lead lutetium

niobium titanium oxide (PbLu0.3Nb0.3Ti0.4O3) **273750-93-9**, Lead lutetium niobium titanium oxide (PbLu0.25Nb0.25Ti0.5O3) **273750-94-0**, Lead lutetium niobium titanium oxide (PbLu0.2Nb0.2Ti0.6O3) **273750-95-1**, Lead lutetium niobium titanium oxide (PbLu0.15Nb0.15Ti0.7O3) **273750-96-2**, Lead lutetium niobium titanium oxide (PbLu0.1Nb0.1Ti0.8O3)
RL: FMU (Formation, unclassified); PRP (Properties); FORM (Formation, nonpreparative)
(structure and properties of hot-pressed Pb(Lu1/2Nb1/2)O3-PbTiO3 binary system ceramics)

L22 ANSWER 3 OF 10 HCAPLUS COPYRIGHT 2006 ACS on STN
1998:697565 Document No. 129:349593 Effects of B-site ions on the electromechanical coupling factors of Pb(B'B")O3-PbTiO3 piezoelectric materials. Yamashita, Yohachi; Harada, Kouichi; Hosono, Yasuharu; Natsume, Shinya; Ichinose, Noboru (Materials and Devices Research Laboratories, R&D Cenier, Toshiba Corporation, Toshiba Yanagi-cho Works, Kawasaki, 210-8501, Japan). Japanese Journal of Applied Physics, Part 1: Regular Papers, Short Notes & Review Papers, 37(9B), 5288-5291 (English) 1998. CODEN: JAPNDE. ISSN: 0021-4922. Publisher: Japanese Journal of Applied Physics.

AB The effect of B-site ions of Pb(B'B")O3-PbTiO3 (B'=Zn, Mg, Ni, Ga, Sc, In, Yb and B"=Nb, Ta) piezoelec. materials on the electromech. coupling factors has been studied. A relationship between electromech. coupling factor kp near a morphotropic phase boundary (MPB) and an order/disorder tendency of B-site ions is systematically discussed. The reason why kp of Pb[((Sc1/2Nb1/2)0.58Ti0.42)]O3 (PSNT59/42) is larger than that of Pb[(Mg1/3Nb2/3)0.68Ti0.32]O3 (PMNT68/32) or Pb[((Sc1/2Ta1/2)0.58Ti0.42)]O3 (PSTT55/45) was explained in terms of the disorder tendency of B-site ions of Pb(B'B")O3-PbTiO3. It may be concluded that a combination of the B-site elements which have a tendency of disorder play an important role in bringing about large electromech. coupling factors in MPB compn. From this viewpoint, MPB compns. of Pb[(Sc1/2Nb1/2)0.29(Mg1/3Nb2/3)0.34Ti0.37]O3 (PSMNT29/34/37) and Pb[(Sc1/2Nb1/2)0.36(Ni1/3Nb2/3)0.26Ti0.38]O3 (PSNNT36/26/38) maybe the two best combinations among all the Pb(B'B")O3-PbTiO3 systems.

IT **170965-44-3**, Lead niobium titanium ytterbium oxide Nb0.25PbTi0.5Yb0.25O3
RL: PRP (Properties)
(effects of B-site ions on electromech. coupling factors of Pb(B'B")O3-PbTiO3 piezoelec. materials)

RN 170965-44-3 HCAPLUS

CN Lead niobium titanium ytterbium oxide (PbNb0.25Ti0.5Yb0.25O3) (9CI) (CA INDEX NAME)

Component	Ratio	Component Registry Number
O	3	17778-80-2
Yb	0.25	7440-64-4

Ti	0.5	7440-32-6
Nb	0.25	7440-03-1
Pb	1	7439-92-1

CC 76-7 (Electric Phenomena)
Section cross-reference(s): 57

IT 132325-77-0, Lead scandium tantalum titanium oxide (PbSc0.28Ta0.28Ti0.4503) 151562-24-2, Lead magnesium niobium titanium oxide PbMg0.23Nb0.45Ti0.3203 153039-90-8, Lead niobium scandium titanium oxide (PbNb0.29Sc0.29Ti0.4203) **170965-44-3**, Lead niobium titanium ytterbium oxide Nb0.25PbTi0.5Yb0.2503 189072-03-5 215544-42-6, Indium lead niobium titanium oxide (In0.31PbNb0.31Ti0.3703) 215544-43-7, Gallium lead niobium titanium oxide (Ga0.25PbNb0.25Ti0.503) 215544-45-9 215544-46-0
RL: PRP (Properties)
(effects of B-site ions on electromech. coupling factors of Pb(B'B")O3-PbTiO3 piezoelec. materials)

L22 ANSWER 4 OF 10 HCAPLUS COPYRIGHT 2006 ACS on STN
1997:784092 Document No. 128:96578 Piezoelectric ceramic compositions for high-oscillation-level devices. Kawai, Hidemasa; Sasaki, Yasuhiro; Takahashi, Sadayuki (NEC Corp., Japan). Jpn. Kokai Tokkyo Koho JP 09315856 A2 19971209 Heisei, 22 pp. (Japanese). CODEN: JKXXAF. APPLICATION: JP 1996-137905 19960531.

AB Title compns. are represented by xPb(Mn1/3Sb2/3)O3-yPb(Yb1/2Nb1/2)O3-zPbTiO3 (x + y + z = 1), where the point (x, y, z) is included in a range and on the lines formed by binding 4 points: (0.15, 0.60, 0.25), (0.03, 0.72, 0.25), (0.03, 0.42, 0.55), and (0.15, 0.30, 0.55) in the ternary phase diagram. The compns. are represented by xPb(Mn1/3Nb2/3)O3-yPb(Yb1/2Nb1/2)O3-zPbTiO3 (x + y + z = 1), where the point (x, y, z) is included in a range and on the lines formed by binding 4 points: (0.03, 0.60, 0.37), (0.005, 0.625, 0.37), (0.005, 0.485, 0.51), and (0.03, 0.46, 0.51) in the ternary phase diagram. The compns. are represented by xPb(Mn1/2W1/2)O3-yPb(Yb1/2Nb1/2)O3-zPbTiO3 (x + y + z = 1), where the point (x, y, z) is included in a range and on the lines formed by binding 4 points: (0.03, 0.60, 0.37), (0.005, 0.625, 0.37), (0.005, 0.485, 0.51), and (0.03, 0.46, 0.51) in the ternary phase diagram. The compns. are represented by xPb(Mn1/3Ta2/3)O3-yPb(Yb1/2Nb1/2)O3-zPbTiO3 (x + y + z = 1), where the point (x, y, z) is included in a range and on the lines formed by binding 4 points: (0.06, 0.57, 0.37), (0.005, 0.625, 0.37), (0.005, 0.485, 0.51), and (0.06, 0.43, 0.51) in the ternary phase diagram. The Pb in the compns. may be substituted with ≤15 mol% Ca, Ba, or St.

IT **170965-40-9P**, Lead niobium titanium ytterbium oxide (PbNb0.3Ti0.4Yb0.303) **170965-44-3P**, Lead niobium titanium ytterbium oxide (PbNb0.25Ti0.5Yb0.2503) **201151-20-4P**, Lead niobium titanium ytterbium oxide (PbNb0.28Ti0.45Yb0.2703) **201151-21-5P**, Lead niobium titanium ytterbium oxide (PbNb0.25Ti0.5Yb0.2403) **201151-27-1P**, Lead niobium titanium ytterbium oxide (PbNb0.27Ti0.45Yb0.2703) **201151-28-2P**, Lead niobium titanium ytterbium oxide

(PbNb0.24Ti0.5Yb0.24O3)
RL: PNU (Preparation, unclassified); TEM (Technical or engineered material use); PREP (Preparation); USES (Uses)
(piezoelec. ceramic compns. for high-oscillation-level devices)

RN 170965-40-9 HCAPLUS
CN Lead niobium titanium ytterbium oxide (PbNb0.3Ti0.4Yb0.3O3) (9CI) (CA INDEX NAME)

Component	Ratio	Component Registry Number
O	3	17778-80-2
Yb	0.3	7440-64-4
Ti	0.4	7440-32-6
Nb	0.3	7440-03-1
Pb	1	7439-92-1

RN 170965-44-3 HCAPLUS
CN Lead niobium titanium ytterbium oxide (PbNb0.25Ti0.5Yb0.25O3) (9CI) (CA INDEX NAME)

Component	Ratio	Component Registry Number
O	3	17778-80-2
Yb	0.25	7440-64-4
Ti	0.5	7440-32-6
Nb	0.25	7440-03-1
Pb	1	7439-92-1

RN 201151-20-4 HCAPLUS
CN Lead niobium titanium ytterbium oxide (PbNb0.28Ti0.45Yb0.27O3) (9CI) (CA INDEX NAME)

Component	Ratio	Component Registry Number
O	3	17778-80-2
Yb	0.27	7440-64-4
Ti	0.45	7440-32-6
Nb	0.28	7440-03-1
Pb	1	7439-92-1

RN 201151-21-5 HCAPLUS
CN Lead niobium titanium ytterbium oxide (PbNb0.25Ti0.5Yb0.24O3) (9CI) (CA INDEX NAME)

Component	Ratio	Component Registry Number
O	3	17778-80-2
Yb	0.24	7440-64-4

Ti	0.5	7440-32-6
Nb	0.25	7440-03-1
Pb	1	7439-92-1

RN 201151-27-1 HCAPLUS
CN Lead niobium titanium ytterbium oxide (PbNb0.27Ti0.45Yb0.27O3) (9CI) (CA INDEX NAME)

Component	Ratio	Component Registry Number
O	3	17778-80-2
Yb	0.27	7440-64-4
Ti	0.45	7440-32-6
Nb	0.27	7440-03-1
Pb	1	7439-92-1

RN 201151-28-2 HCAPLUS
CN Lead niobium titanium ytterbium oxide (PbNb0.24Ti0.5Yb0.24O3) (9CI) (CA INDEX NAME)

Component	Ratio	Component Registry Number
O	3	17778-80-2
Yb	0.24	7440-64-4
Ti	0.5	7440-32-6
Nb	0.24	7440-03-1
Pb	1	7439-92-1

IC ICM C04B035-46
ICS C04B035-495; H01L041-187
CC 76-7 (Electric Phenomena)
Section cross-reference(s): 57
IT **170965-40-9P**, Lead niobium titanium ytterbium oxide (PbNb0.3Ti0.4Yb0.3O3) **170965-44-3P**, Lead niobium titanium ytterbium oxide (PbNb0.25Ti0.5Yb0.25O3) 201151-08-8P 201151-09-9P 201151-10-2P 201151-11-3P 201151-12-4P 201151-13-5P 201151-14-6P 201151-15-7P 201151-16-8P 201151-17-9P 201151-18-0P 201151-19-1P **201151-20-4P**, Lead niobium titanium ytterbium oxide (PbNb0.28Ti0.45Yb0.27O3) **201151-21-5P**, Lead niobium titanium ytterbium oxide (PbNb0.25Ti0.5Yb0.24O3) 201151-22-6P 201151-23-7P 201151-24-8P 201151-25-9P 201151-26-0P **201151-27-1P**, Lead niobium titanium ytterbium oxide (PbNb0.27Ti0.45Yb0.27O3) **201151-28-2P**, Lead niobium titanium ytterbium oxide (PbNb0.24Ti0.5Yb0.24O3) 201151-29-3P 201151-30-6P 201151-31-7P 201151-32-8P 201151-33-9P 201151-34-0P 201151-36-2P 201151-38-4P 201151-40-8P 201151-42-0P 201151-44-2P 201151-46-4P 201151-47-5P 201151-48-6P 201151-49-7P
RL: PNU (Preparation, unclassified); TEM (Technical or engineered material use); PREP (Preparation); USES (Uses)

(piezoelec. ceramic compns. for high-oscillation-level devices)

L22 ANSWER 5 OF 10 HCAPLUS COPYRIGHT 2006 ACS on STN
1981:417193 Document No. 95:17193 Synthesis and study of some properties of quaternary oxides containing erbium. Belyaev, I. N.; Sholokhovich, M. L.; Nguyen Khang (Rostov. Gos. Univ., Rostov, USSR). Zhurnal Neorganicheskoi Khimii, 26(4), 877-80 (Russian) 1981. CODEN: ZNOKAQ. ISSN: 0044-457X.

AB The solid-phase reaction of MM1O3 with ErM2O4 (M = Pd, Cd, Mg; M1 = Ti, Zr, Hf, Sn; M2 = Nb, Ta) at 1200-1300° produced MErM1M2O7 with a pyrochlore-type crystal structure. The Er quaternary oxides were identified by x-ray phase anal. MgM1O3 did not react with ErNbO4.

IT **77848-46-5P 77848-49-8P 77848-50-1P**
RL: PRP (Properties); SPN (Synthetic preparation); PREP (Preparation)
(prepn. and crystal structure of)

RN 77848-46-5 HCAPLUS
CN Erbium hafnium lead niobium oxide (ErHfPbNbO7) (9CI) (CA INDEX NAME)

Component	Ratio	Component Registry Number
O	7	17778-80-2
Hf	1	7440-58-6
Er	1	7440-52-0
Nb	1	7440-03-1
Pb	1	7439-92-1

RN 77848-49-8 HCAPLUS
CN Erbium lead niobium titanium oxide (ErPbNbTiO7) (9CI) (CA INDEX NAME)

Component	Ratio	Component Registry Number
O	7	17778-80-2
Er	1	7440-52-0
Ti	1	7440-32-6
Nb	1	7440-03-1
Pb	1	7439-92-1

RN 77848-50-1 HCAPLUS
CN Erbium lead niobium zirconium oxide (ErPbNbZrO7) (9CI) (CA INDEX NAME)

Component	Ratio	Component Registry Number
O	7	17778-80-2
Zr	1	7440-67-7

Er	1	7440-52-0
Nb	1	7440-03-1
Pb	1	7439-92-1

CC 78-3 (Inorganic Chemicals and Reactions)
Section cross-reference(s): 75

IT 58072-15-4P 59186-83-3P 62852-74-8P 64296-74-8P 67115-62-2P
77848-32-9P 77848-33-0P 77848-34-1P **77848-46-5P**
77848-47-6P 77848-48-7P **77848-49-8P 77848-50-1P**
77848-51-2P 77848-52-3P 77848-53-4P 77908-55-5P 77908-56-6P
77908-57-7P 77908-58-8P
RL: PRP (Properties); SPN (Synthetic preparation); PREP (Preparation)
(prepn. and crystal structure of)

L22 ANSWER 6 OF 10 HCAPLUS COPYRIGHT 2006 ACS on STN

1980:485959 Document No. 93:85959 Crystallographic study of some mixed pyrochlores. Patil, S. L.; Darshane, V. S. (Dep. Chem., Inst. Sci., Bombay, 400 032, India). Current Science, 49(11), 430-1 (English) 1980. CODEN: CUSCAM. ISSN: 0011-3891.

AB PbXTiNbO7 (X = Sm, Gd, Dy, Y, Nd, and Bi) were prepd. by the ceramic technique. All except the Nd compd. possess the pyrochlore structure. The Nd compd. contains a pyrochlore phase and a Nd2Ti2O7 monoclinic phase. The lattice parameter is given and the radius ratio discussed.

IT **37347-35-6P 56126-81-9P 56940-92-2P**
74505-82-1P
RL: SPN (Synthetic preparation); PREP (Preparation)
(prepn. and crystal structure of pyrochlore-type)

RN 37347-35-6 HCAPLUS

CN Lead neodymium niobium titanium oxide (PbNdNbTiO7) (9CI) (CA INDEX NAME)

Component	Ratio	Component Registry Number
O	7	17778-80-2
Ti	1	7440-32-6
Nb	1	7440-03-1
Nd	1	7440-00-8
Pb	1	7439-92-1

RN 56126-81-9 HCAPLUS

CN Lead niobium samarium titanium oxide (PbNbSmTiO7) (9CI) (CA INDEX NAME)

Component	Ratio	Component Registry Number
O	7	17778-80-2
Ti	1	7440-32-6
Sm	1	7440-19-9

Nb	1	7440-03-1
Pb	1	7439-92-1

RN 56940-92-2 HCAPLUS
CN Dysprosium lead niobium titanium oxide (DyPbNbTiO7) (9CI) (CA INDEX NAME)

Component	Ratio	Component Registry Number
O	7	17778-80-2
Ti	1	7440-32-6
Nb	1	7440-03-1
Pb	1	7439-92-1
Dy	1	7429-91-6

RN 74505-82-1 HCAPLUS
CN Gadolinium lead niobium titanium oxide (GdPbNbTiO7) (9CI) (CA INDEX NAME)

Component	Ratio	Component Registry Number
O	7	17778-80-2
Gd	1	7440-54-2
Ti	1	7440-32-6
Nb	1	7440-03-1
Pb	1	7439-92-1

CC 75-5 (Crystallization and Crystal Structure)
IT 12654-65-8P **37347-35-6P 56126-81-9P**
56940-92-2P 74505-82-1P 74505-83-2P
RL: SPN (Synthetic preparation); PREP (Preparation)
(prepn. and crystal structure of pyrochlore-type)

L22 ANSWER 7 OF 10 HCAPLUS COPYRIGHT 2006 ACS on STN
1977:575720 Document No. 87:175720 Production of lead lanthanum zirconium niobium oxide (PbLaZrNbO7) and lead neodymium zirconium niobium oxide (PbNdZrNbO7) single crystals of a pyrochlore structure. Belyaev, I. N.; Aver'yanova, L. N.; Sogomonyan, R. G. (Rostov. Gos. Univ., Rostov, USSR). Izvestiya Vysshikh Uchebnykh Zavedenii, Khimiya i Khimicheskaya Tekhnologiya, 20(7), 1100 (Russian) 1977. CODEN: IVUKAR. ISSN: 0579-2991.
AB Single crystals of PbLaZrNbO7 and PbNdZrNbO7 were obtained by spontaneous crystn. from soln. in melt of KF, PbO, and B2O3. The compn. of the compds. detd. earlier by x-ray methods, was confirmed by chem. anal. of the single crystals.
IT **64616-13-3**
RL: PEP (Physical, engineering or chemical process); PROC (Process)
(crystal growth of, from flux melts)
RN 64616-13-3 HCAPLUS
CN Lead neodymium niobium zirconium oxide (PbNdNbZrO7) (9CI) (CA INDEX

NAME)

Component	Ratio	Component Registry Number
O	7	17778-80-2
Zr	1	7440-67-7
Nb	1	7440-03-1
Nd	1	7440-00-8
Pb	1	7439-92-1

CC 75-1 (Crystallization and Crystal Structure)
IT 12664-78-7 **64616-13-3**
RL: PEP (Physical, engineering or chemical process); PROC (Process)
(crystal growth of, from flux melts)

L22 ANSWER 8 OF 10 HCAPLUS COPYRIGHT 2006 ACS on STN
1976:455876 Document No. 85:55876 Synthesis and some properties of AIIDyBIVNbO7 compounds with pyrochlore crystal structure. Belyaev, I. N.; Peresun'ko, A. F.; Korolev, G. K. (Rostov.-na-Donu Gos. Univ., Rostov-on-Don, USSR). Izvestiya Vysshikh Uchebnykh Zavedenii, Khimiya i Khimicheskaya Tekhnologiya, 19(4), 547-51 (Russian) 1976. CODEN: IVUKAR. ISSN: 0579-2991.
AB Compds. with the general formula AIIDyBIVNbO7 (AII = Cd, Ca, Sr, Pb; BIV = Ti, Sn, Zr, Hf) were prepd. by the solid phase reaction of AIIBIVO3 and DyNbO4 at <1400°. These new quaternary oxides have a pyrochlore type structure. For ceramic materials of all the compds., the temp. dependence of the dielec. permeability and the tangent of the angle of the dielec. loss was studied at 160-800°.
IT **56940-92-2P 59929-53-2P 59929-55-4P**
RL: PRP (Properties); SPN (Synthetic preparation); PREP (Preparation)
(prepn. and dielec. properties of)
RN 56940-92-2 HCAPLUS
CN Dysprosium lead niobium titanium oxide (DyPbNbTiO7) (9CI) (CA INDEX NAME)

Component	Ratio	Component Registry Number
O	7	17778-80-2
Ti	1	7440-32-6
Nb	1	7440-03-1
Pb	1	7439-92-1
Dy	1	7429-91-6

RN 59929-53-2 HCAPLUS
CN Dysprosium hafnium lead niobium oxide (DyHfPbNbO7) (9CI) (CA INDEX NAME)

Component	Ratio	Component

		Registry Number
O	7	17778-80-2
Hf	1	7440-58-6
Nb	1	7440-03-1
Pb	1	7439-92-1
Dy	1	7429-91-6

RN 59929-55-4 HCAPLUS
CN Dysprosium lead niobium zirconium oxide (DyPbNbZrO7) (9CI) (CA INDEX NAME)

Component	Ratio	Component Registry Number
O	7	17778-80-2
Zr	1	7440-67-7
Nb	1	7440-03-1
Pb	1	7439-92-1
Dy	1	7429-91-6

CC 78-3 (Inorganic Chemicals and Reactions)
Section cross-reference(s): 76
IT **56940-92-2P** 59186-82-2P 59929-45-2P 59929-46-3P
59929-47-4P 59929-48-5P 59929-49-6P 59929-50-9P 59929-51-0P
59929-53-2P 59929-54-3P **59929-55-4P**
59929-56-5P 59929-57-6P
RL: PRP (Properties); SPN (Synthetic preparation); PREP (Preparation)
(prepn. and dielec. properties of)

L22 ANSWER 9 OF 10 HCAPLUS COPYRIGHT 2006 ACS on STN
1975:436150 Document No. 83:36150 New samarium niobate (AIISmBIVNbO7), A is calcium, strontium, barium, lead, or cadmium, β is titanium, tin, zirconium, or hafnium) compounds with the pyrochlore(V) type crystalline structure. Belyaev, I. N.; Shramova, A. G. (Rostov. Gos. Univ., Rostov, USSR). Izvestiya Akademii Nauk SSSR, Neorganicheskie Materialy, 11(2), 269-72 (Russian) 1975. CODEN: IVNMAW. ISSN: 0002-337X.
AB By using the solid-phase reaction method at 800-1400°, the interaction in the ABO3--SmNbO4 systems, where A = Ca, Sr, Ba, Pb, Cd, Zn, Ni, and B = Ti, Sn, Zr, Hf, Ce was studied. The formation of 16 new ASmBNbO7 compds. was established where A = Pb, Cd, and B = Ti, Sn, Zr, Hf; A = Ca, and B = Ti, Sn, Zr, Hf; A = Sr, and B = Sn, Zr, Hf; A = Ba, and B = Hf. In the systems where CeO2 takes part, the diffraction lines for CeO2 and SmNbO4 are slightly displaced, which attests to their low mutual soly. in the solid state. X-ray diffraction data and unit-cell parameter (a) are given for the new compds.
IT **56094-90-7P 56126-81-9P 56126-82-0P**
RL: PRP (Properties); SPN (Synthetic preparation); PREP (Preparation)

(prepn. and crystal structure of)
RN 56094-90-7 HCAPLUS
CN Hafnium lead niobium samarium oxide (HfPbNbSmO7) (9CI) (CA INDEX NAME)

Component	Ratio	Component Registry Number
O	7	17778-80-2
Hf	1	7440-58-6
Sm	1	7440-19-9
Nb	1	7440-03-1
Pb	1	7439-92-1

RN 56126-81-9 HCAPLUS
CN Lead niobium samarium titanium oxide (PbNbSmTiO7) (9CI) (CA INDEX NAME)

Component	Ratio	Component Registry Number
O	7	17778-80-2
Ti	1	7440-32-6
Sm	1	7440-19-9
Nb	1	7440-03-1
Pb	1	7439-92-1

RN 56126-82-0 HCAPLUS
CN Lead niobium samarium zirconium oxide (PbNbSmZrO7) (9CI) (CA INDEX NAME)

Component	Ratio	Component Registry Number
O	7	17778-80-2
Zr	1	7440-67-7
Sm	1	7440-19-9
Nb	1	7440-03-1
Pb	1	7439-92-1

CC 75-5 (Crystallization and Crystal Structure)
IT 56091-65-7P 56092-64-9P 56094-54-3P **56094-90-7P**
56094-91-8P 56095-32-0P 56095-33-1P 56095-34-2P 56095-35-3P
56095-37-5P 56095-38-6P 56095-39-7P 56095-40-0P 56126-80-8P
56126-81-9P 56126-82-0P
RL: PRP (Properties); SPN (Synthetic preparation); PREP (Preparation)
(prepn. and crystal structure of)

L22 ANSWER 10 OF 10 HCAPLUS COPYRIGHT 2006 ACS on STN
1973:8800 Document No. 78:8800 New compounds with pyrochlore structure. Belyaev, I. N.; Aver'yanova, L. N.; Ezhov, V. M.;

Balashov, D. V. (USSR). Zhurnal Neorganicheskoi Khimii, 17(10), 2842-3 (Russian) 1972. CODEN: ZNOKAQ. ISSN: 0044-457X.

AB The pyrochlore structure was identified by the a parameter of its unit cell, equal to 10.567, 10.710, 10.740, 10.740, 10.740, 10.556, 10.711, 10.255, 10.255, 10.348, and 10.348 Å in CaLaZrTaO7, SrLaZrTaO7, BaLaZrTaO7, BaZrO3, LaTaO4, CdLaZrTaO7, PbLaZrTaO7, CdNdTiNbO7, CdNdTiTaO7, PbNdTiNbO7, and PbNdTiTaO7, resp. The a values were detd. from x-ray diffraction diagrams. The pyrochlore structure was not formed in the systems SrTiO3-LaNbO4(LaTaO4) and SrTiO3-NdNbO4(NdTaO4).

IT **37347-35-6**
RL: PRP (Properties)
(crystal structure of)

RN 37347-35-6 HCAPLUS

CN Lead neodymium niobium titanium oxide (PbNdNbTiO7) (9CI) (CA INDEX NAME)

Component	Ratio	Component Registry Number
O	7	17778-80-2
Ti	1	7440-32-6
Nb	1	7440-03-1
Nd	1	7440-00-8
Pb	1	7439-92-1

CC 70-3 (Crystallization and Crystal Structure)

IT 12009-21-1 12056-84-7 37342-57-7 37346-32-0 37346-37-5 37346-38-6 37346-39-7 37347-26-5 37347-27-6 **37347-35-6** 37347-36-7
RL: PRP (Properties)
(crystal structure of)

=> d l18 cbib abs hitstr hitind 1-3 50-53 105-107

L18 ANSWER 1 OF 107 HCAPLUS COPYRIGHT 2006 ACS on STN

2004:856439 Document No. 142:83955 Etching gas for **ferroelectric film.** Ju, Suk Ho; Yu, Min Hee; Oh, Sang Jung; Yu, Cha Young (Samsung Electronics Co, Ltd., S. Korea). Repub. Korea KR 234363 B1 **19991215**, No pp. given (Korean). CODEN: KRXXFC. APPLICATION: KR 1997-523 19970110.

AB **Ferroelec. film** etching gas is provided to have high etching selection rate about a **ferroelec. film** and a platinum group metal thin film to produce a semiconductor device with high reliability. A gas for etching **ferroelec. film** of a semiconductor device includes Ar gas, HBr gas and CF4 gas. The **ferroelec. film** etching gas further includes CHF3 gas to have high etching selection rate about a **ferroelec. film** and a heat resistant metal. CHF3 gas is 30 to 60% of the whole etching gas, the **ferroelec. film** is one selected from a group

including PZT, PLZT(Pb(La,Zr)TiO3) and PNZT(Pb(Nb)(Zr,Ti)O3), and the platinum group metal thin film is one selected from a group including Pt, Ir and IrO2. The **ferroelec. film** etching gas prevents damage of an oxide layer and the platinum group metal thin **film** under the **ferroelec. film** to enable prodn. of a semiconductor device with high reliability.

IT **56572-83-9**, Lead niobium titanium zirconium oxide
RL: CPS (Chemical process); PEP (Physical, engineering or chemical process); PROC (Process)
(etching gas for **ferroelec. film**)

RN 56572-83-9 HCAPLUS

CN Lead niobium titanium zirconium oxide (9CI) (CA INDEX NAME)

Component	Ratio	Component Registry Number
O	x	17778-80-2
Zr	x	7440-67-7
Ti	x	7440-32-6
Nb	x	7440-03-1
Pb	x	7439-92-1

IC ICM H01L021-302

CC 76-3 (Electric Phenomena)

ST etching gas **ferroelec film**

IT Etching
Ferroelectric films
Semiconductor devices
(etching gas for **ferroelec. film**)

IT 7439-88-5, Iridium, processes 7440-06-4, Platinum, processes 12030-49-8, Iridium oxide (IrO2) 12626-81-2, PZT 12676-60-7, PLZT **56572-83-9**, Lead niobium titanium zirconium oxide
RL: CPS (Chemical process); PEP (Physical, engineering or chemical process); PROC (Process)
(etching gas for **ferroelec. film**)

L18 ANSWER 2 OF 107 HCAPLUS COPYRIGHT 2006 ACS on STN

2004:371211 Document No. 140:384731 **Ferroelectric film**, **ferroelectric** capacitor, **ferroelectric** memory, piezoelectric device, semiconductor device, method for manufacturing **ferroelectric film**, and method for manufacturing ferroelectric capacitor. Kijima, Takeshi; Hamada, Yasuaki; Natori, Eiji; Ohashi, Koji (Seiko Epson Corporation, Japan). PCT Int. Appl. WO 2004038733 A1 20040506, 91 pp. DESIGNATED STATES: W: CN, KR; RW: AT, BE, CH, CY, DE, DK, ES, FI, FR, GB, GR, IE, IT, LU, MC, NL, PT, SE, TR. (Japanese). CODEN: PIXXD2. APPLICATION: WO 2003-JP13556 20031023. PRIORITY: JP 2002-309487 20021024; JP 2003-76129 20030319; JP 2003-85791 20030326; JP 2003-294072 20030818; JP 2003-302900 20030827.

AB A **ferroelec. film** is composed of an oxide of

AB1-xNbxO3. The component A comprises at least Pb, and the component B comprises at least one of Zr, Ti, V, W, Hf, and Ta. The **ferroelec. film** contains Nb in an amt. of 0.05 ≤ x < 1. This **ferroelec. film** can be used in any of 1T1C, 2T2C and simple matrix ferroelec. memories.

IT **683745-93-9**, Lead niobium titanium zirconium oxide (PbNb0.2Ti0.6Zr0.2O3) **683745-94-0**, Lead niobium titanium zirconium oxide (PbNb0.1Ti0.7Zr0.2O3)
RL: DEV (Device component use); USES (Uses)
(**ferroelec. film, ferroelec.** capacitor, **ferroelec.** memory, piezoelec. device, semiconductor device, method for manufg. **ferroelec. film**, and method for manufg. ferroelec. capacitor)

RN 683745-93-9 HCAPLUS
CN Lead niobium titanium zirconium oxide (PbNb0.2Ti0.6Zr0.2O3) (9CI) (CA INDEX NAME)

Component	Ratio	Component Registry Number
O	3	17778-80-2
Zr	0.2	7440-67-7
Ti	0.6	7440-32-6
Nb	0.2	7440-03-1
Pb	1	7439-92-1

RN 683745-94-0 HCAPLUS
CN Lead niobium titanium zirconium oxide (PbNb0.1Ti0.7Zr0.2O3) (9CI) (CA INDEX NAME)

Component	Ratio	Component Registry Number
O	3	17778-80-2
Zr	0.2	7440-67-7
Ti	0.7	7440-32-6
Nb	0.1	7440-03-1
Pb	1	7439-92-1

IC ICM H01B003-12
ICS C01G025-00; C01G033-00; H01L027-10; H01L041-18
CC 76-10 (Electric Phenomena)
ST **ferroelec film** capacitor memory piezoelec device
IT **Ferroelectric** capacitors
Ferroelectric films
Ferroelectric memory devices
(**ferroelec. film, ferroelec.** capacitor, **ferroelec.** memory, piezoelec. device, semiconductor device, method for manufg. **ferroelec. film**, and method for manufg. ferroelec. capacitor)
IT **683745-93-9**, Lead niobium titanium zirconium oxide (PbNb0.2Ti0.6Zr0.2O3) **683745-94-0**, Lead niobium titanium

zirconium oxide (PbNb0.1Ti0.7Zr0.2O3)
RL: DEV (Device component use); USES (Uses)
(**ferroelec. film, ferroelec.** capacitor, **ferroelec.** memory, piezoelec. device, semiconductor device, method for manufg. **ferroelec. film**, and method for manufg. ferroelec. capacitor)

L18 ANSWER 3 OF 107 HCAPLUS COPYRIGHT 2006 ACS on STN
2004:264601 Document No. 140:295952 Textured Bi-based oxide ceramic **films** for **ferroelectric** devices. Desrochers, Debra A.; Hendrix, Bryan C.; Roeder, Jeffrey F.; Hintermaier, Frank S. (Advanced Technology Materials, Inc., USA; Infineon Technologies North America Corp.). U.S. US 6713797 B1 20040330, 14 pp., Cont.-in-part of U.S. Ser. No. 107,861. (English). CODEN: USXXAM. APPLICATION: US 1998-197984 19981123. PRIORITY: US 1998-107861 19980630.

AB The invention relates generally to Bi-based metal oxide ceramic films used in integrated circuits (ICs). More particularly, the invention relates to textured Bi-based metal oxide ceramic films with high switchable elec. polarization. A nonvolatile memory cell is fabricated in which the capacitor comprises a Bi-based metal oxide having a crystallog. texture to produce high switchable polarization. In 1 embodiment, the Bi-based metal oxide ceramic is expressed by YaBibX2Oc, where Y represents a 2-valent cation and X represents a 5-valent cation. In 1 embodiment, Y is at least one element selected from Sr, Ba, Pb, and Ca; and X represents at least one element selected from Ta and Nb. The Bi-based metal oxide is deposited amorphously by CVD. The amorphous CVD material is post-deposition processed to transform it into a material with the desired elec. properties.

IT **270073-37-5P**, Bismuth lead niobium tantalum oxide
RL: DEV (Device component use); PNU (Preparation, unclassified); PREP (Preparation); USES (Uses)
(textured Bi-based oxide ceramic **films** for **ferroelec.** devices)
RN 270073-37-5 HCAPLUS
CN Bismuth lead niobium tantalum oxide (9CI) (CA INDEX NAME)

Component	Ratio	Component Registry Number
O	x	17778-80-2
Bi	x	7440-69-9
Ta	x	7440-25-7
Nb	x	7440-03-1
Pb	x	7439-92-1

IC ICM H01L029-76
ICS H01L029-94; H01L031-062; H01L031-119
INCL 257295000; 257310000
CC 76-8 (Electric Phenomena)
Section cross-reference(s): 57

IT Films
(ceramic; textured Bi-based oxide ceramic **films** for **ferroelec.** devices)
IT Vapor deposition process
(chem.; textured Bi-based oxide ceramic **films** for **ferroelec.** devices)
IT Nonvolatile memory devices
(ferroelec.; textured Bi-based oxide ceramic **films** for **ferroelec.** devices)
IT Ceramics
(films; textured Bi-based oxide ceramic **films** for **ferroelec.** devices)
IT Ferroelectric memory devices
(nonvolatile; textured Bi-based oxide ceramic **films** for **ferroelec.** devices)
IT Annealing
Ferroelectric apparatus
Ferroelectric capacitors
Integrated circuits
Texture (metallographic)
(textured Bi-based oxide ceramic **films** for **ferroelec.** devices)
IT Oxides (inorganic), uses
RL: DEV (Device component use); USES (Uses)
(textured Bi-based oxide ceramic **films** for **ferroelec.** devices)
IT 162033-89-8P, Bismuth niobium strontium oxide 166877-45-8DP, Bismuth strontium tantalum oxide, derivs. 188359-86-6P, Bismuth niobium strontium tantalum oxide **270073-37-5P**, Bismuth lead niobium tantalum oxide 270073-41-1P, Barium bismuth calcium lead niobium strontium tantalum oxide 277748-33-1P, Bismuth calcium niobium strontium tantalum oxide
RL: DEV (Device component use); PNU (Preparation, unclassified); PREP (Preparation); USES (Uses)
(textured Bi-based oxide ceramic **films** for **ferroelec.** devices)
IT 142617-53-6, Bismuth, tris(2,2,6,6-tetramethyl-3,5-heptanedionato-κO,κO')-, (OC-6-11)-
RL: RCT (Reactant); RACT (Reactant or reagent)
(vapor deposition precursor; textured Bi-based oxide ceramic **films** for **ferroelec.** devices)
IT 111-65-9, Octane, processes 124-18-5, Decane 3030-47-5, Pentamethyldiethylenetriamine
RL: NUU (Other use, unclassified); PEP (Physical, engineering or chemical process); PYP (Physical process); PROC (Process); USES (Uses)
(vapor deposition solvent; textured Bi-based oxide ceramic **films** for **ferroelec.** devices)

L18 ANSWER 50 OF 107 HCAPLUS COPYRIGHT 2006 ACS on STN
2000:400121 Document No. 133:186229 Phase development in pulsed laser deposited Pb[Yb0.5Nb0.5]O3-PbTiO3 thin films. Bornand, V.;

Trolier-McKinstry, S. (Materials Research Laboratory, Department of Materials Science and Engineering, The Pennsylvania State University, University Park, PA, 16802-4801, USA). Thin Solid Films, 370(1,2), 70-77 (English) **2000.** CODEN: THSFAP. ISSN: 0040-6090. Publisher: Elsevier Science S.A..

AB (1-X)Pb[Yb0.5Nb0.5]O3 - xPbTiO3 (PYbN-PT, x = 0.4 and 0.5)/SrRuO3 (SRO) heterostructures have been prepd. by pulsed laser deposition (PLD) on <100>pc-oriented LaAlO3 (LAO) substrates (the subscript pc refers here to the pseudo-cubic perovskite subcell). Careful control of both lead volatilization and pyrochlore formation during the growth appears to be essential to obtain perovskite PYbN-PT thin films with good cryst., elec. and ferroelec. properties. By utilizing PbO-enriched ceramic targets and adjusting deposition parameters such as the laser frequency, the chamber pressure, the target to substrate distance and/or the substrate temp., high-quality thin films can be successfully grown with a single out-of-plane <001>pc orientation and an in-plane heteroepitaxial arrangement of [110]pc PYbN-PT // [110]pc. SrRuO3. When processed in the 560 - 660° temp. range, with a dynamic O3/O2 pressure of 300 - 400 mTorr and relatively high laser repetition rates, PYbN-PT **films** exhibit improved **ferroelec.** properties. The typical values of the remanent (Pr) and satn. (Ps) polarizations increase up to 50 and 80 μC/cm2, resp.

IT **170965-40-9**, Lead niobium titanium ytterbium oxide (PbNb0.3Ti0.4Yb0.3O3) **170965-44-3**, Lead niobium titanium ytterbium oxide (PbNb0.25Ti0.5Yb0.25O3)
RL: PEP (Physical, engineering or chemical process); PRP (Properties); PROC (Process)
(ceramic thin film; phase development in pulsed laser deposited)

RN 170965-40-9 HCAPLUS

CN Lead niobium titanium ytterbium oxide (PbNb0.3Ti0.4Yb0.3O3) (9CI) (CA INDEX NAME)

Component	Ratio	Component Registry Number
O	3	17778-80-2
Yb	0.3	7440-64-4
Ti	0.4	7440-32-6
Nb	0.3	7440-03-1
Pb	1	7439-92-1

RN 170965-44-3 HCAPLUS

CN Lead niobium titanium ytterbium oxide (PbNb0.25Ti0.5Yb0.25O3) (9CI) (CA INDEX NAME)

Component	Ratio	Component Registry Number
O	3	17778-80-2
Yb	0.25	7440-64-4

Ti	0.5	7440-32-6
Nb	0.25	7440-03-1
Pb	1	7439-92-1

CC 76-8 (Electric Phenomena)
Section cross-reference(s): 56, 57, 75, 77

IT **Ferroelectric films**
(Pb[Yb0.5Nb0.5]O3-PbTiO3; phase development in pulsed laser deposited)

IT 12034-65-0, Lead niobium ytterbium oxide (PbNb0.5Yb0.5O3) 12060-00-3, Lead titanium oxide (PbTiO3) **170965-40-9**, Lead niobium titanium ytterbium oxide (PbNb0.3Ti0.4Yb0.3O3) **170965-44-3**, Lead niobium titanium ytterbium oxide (PbNb0.25Ti0.5Yb0.25O3)
RL: PEP (Physical, engineering or chemical process); PRP (Properties); PROC (Process)
(ceramic thin film; phase development in pulsed laser deposited)

L18 ANSWER 51 OF 107 HCAPLUS COPYRIGHT 2006 ACS on STN
2000:388526 Document No. 133:11829 Lead titanate isolation layers for use in fabricating PZT-based capacitors and similar structures. Boyer, Leonard L.; Evans, Joseph T., Jr.; Velasquez, Naomi B. (Radiant Technologies, Inc., USA). U.S. US 6074885 A **20000613**, 5 pp. (English). CODEN: USXXAM. APPLICATION: US 1997-978308 19971125.

AB A method for constructing a device having a bottom electrode in contact with a **layer** of a **ferroelec.** dielec. material. In the method of the present invention, a layer of a field ferroelec. material is deposited on a substrate and etched to form a trench in which the bottom electrode is constructed. The bottom electrode is then deposited and a **layer** of the **ferroelec.** dielec. material is deposited over the bottom electrode and at least a portion of the field ferroelec. material. The **ferroelec. layers** are deposited in a perovskite state. These layers are etched back to the substrate in those areas that are outside of the device.

IT **56572-83-9**, Lead niobium titanium zirconium oxide
RL: DEV (Device component use); PEP (Physical, engineering or chemical process); PROC (Process); USES (Uses)
(lead titanate isolation layers for use in fabricating PZT-based capacitors and similar structures)

RN 56572-83-9 HCAPLUS
CN Lead niobium titanium zirconium oxide (9CI) (CA INDEX NAME)

Component	Ratio	Component Registry Number
O	x	17778-80-2
Zr	x	7440-67-7
Ti	x	7440-32-6
Nb	x	7440-03-1
Pb	x	7439-92-1

IC ICM H01L029-94
ICS H01L021-314
INCL 438003000
CC 76-8 (Electric Phenomena)
IT Capacitor electrodes
Ferroelectric capacitors
Ferroelectric films
Perovskite-type crystals
Semiconductor device fabrication
(lead titanate isolation layers for use in fabricating PZT-based capacitors and similar structures)
IT 12060-00-3, Lead titanate 12626-81-2, PZT 12676-60-7, Lanthanum lead titanium zirconium oxide (La0-1Pb0-1Ti0-1Zr0-1O3) **56572-83-9**, Lead niobium titanium zirconium oxide 114952-68-0, Lanthanum lead titanium oxide (La0-1Pb0-1TiO3)
RL: DEV (Device component use); PEP (Physical, engineering or chemical process); PROC (Process); USES (Uses)
(lead titanate isolation layers for use in fabricating PZT-based capacitors and similar structures)

L18 ANSWER 52 OF 107 HCAPLUS COPYRIGHT 2006 ACS on STN
2000:368776 Document No. 132:355768 Textured Bi-based oxide **ferroelectric** ceramic **films** for capacitors, memory devices, and switches. Desrochers, Debra A.; Hendrix, Bryan C.; Roeder, Jeffrey F.; Hintermaier, Frank S. (Infineon Technologies A.-G., Germany; Advanced Technology Materials, Inc.). PCT Int. Appl. WO 2000031791 A1 **20000602**, 41 pp. DESIGNATED STATES: W: CN, JP, KR; RW: AT, BE, CH, CY, DE, DK, ES, FI, FR, GB, GR, IE, IT, LU, MC, NL, PT, SE. (English). CODEN: PIXXD2. APPLICATION: WO 1999-US27683 19991122. PRIORITY: US 1998-197984 19981123.
AB A nonvolatile memory cell is claimed wherein the capacitor comprises a Bi-based metal oxide having a crystallog. texture to produce high switchable polarization. SrBi2Ta2O9 is a suitable ferroelec.
IT **270073-37-5P**, Bismuth lead niobium tantalum oxide
RL: DEV (Device component use); PEP (Physical, engineering or chemical process); SPN (Synthetic preparation); TEM (Technical or engineered material use); PREP (Preparation); PROC (Process); USES (Uses)
(textured bismuth-based oxide **ferroelec.** ceramic **films** for capacitors, memory devices, and switches)
RN 270073-37-5 HCAPLUS
CN Bismuth lead niobium tantalum oxide (9CI) (CA INDEX NAME)

Component	Ratio	Component Registry Number
O	x	17778-80-2
Bi	x	7440-69-9
Ta	x	7440-25-7
Nb	x	7440-03-1

Pb | x | 7439-92-1

IC ICM H01L021-316
CC 76-8 (Electric Phenomena)
ST bismuth oxide compd **ferroelec film**
IT Electric switches
(ferroelec.; textured bismuth-based oxide **ferroelec.** ceramic **films** for capacitors, memory devices, and switches)
IT Ferroelectric capacitors
Ferroelectric films
Nonvolatile memory devices
(textured bismuth-based oxide **ferroelec.** ceramic **films** for capacitors, memory devices, and switches)
IT 7440-69-9DP, Bismuth, oxide compds., processes 12537-53-0P, Bismuth calcium tantalum oxide 50811-07-9P, Bismuth strontium tantalum oxide (Bi2SrTa2O9) 104626-03-1P, Bismuth lead niobium oxide 162033-89-8P, Bismuth niobium strontium oxide 166877-45-8P, Bismuth strontium tantalum oxide 170352-35-9P, Bismuth calcium niobium oxide 188359-86-6P, Bismuth niobium strontium tantalum oxide 188776-16-1P, Barium bismuth tantalum oxide 188776-18-3P, Barium bismuth niobium oxide 270073-33-1P, Bismuth lead tantalum oxide 270073-35-3P, Barium bismuth niobium tantalum oxide **270073-37-5P**, Bismuth lead niobium tantalum oxide 270073-39-7P, Bismuth calcium niobium tantalum oxide 270073-41-1P
RL: DEV (Device component use); PEP (Physical, engineering or chemical process); SPN (Synthetic preparation); TEM (Technical or engineered material use); PREP (Preparation); PROC (Process); USES (Uses)
(textured bismuth-based oxide **ferroelec.** ceramic **films** for capacitors, memory devices, and switches)

L18 ANSWER 53 OF 107 HCAPLUS COPYRIGHT 2006 ACS on STN
2000:210562 Document No. 132:245032 **Ferroelectric** thin **films** of reduced tetragonality for FRAMs. Ramesh, Ramamoorthy (Telcordia Technologies, Inc., USA; University of Maryland). PCT Int. Appl. WO 2000017936 A1 **20000330**, 29 pp. DESIGNATED STATES: W: AU, CA, CN, ID, IN, JP, KR, MX, SG; RW: AT, BE, CH, CY, DE, DK, ES, FI, FR, GB, GR, IE, IT, LU, MC, NL, PT, SE. (English). CODEN: PIXXD2. APPLICATION: WO 1999-US22178 19990924. PRIORITY: US 1998-160778 19980924.
AB A ferroelec. material, esp. as incorporated into a crystallog. oriented epitaxial ferroelec. cell, of Pb1-xLaxZryTi1-yO3 or Pb1-xNbxZryTi1-yO3 having a moderately high La or Nb content such that the unit cell is less tetragonal, i.e., more nearly cubic, so as to reduce stress effects. A most preferred value of the c/a const. is .apprx.1.01. Exemplary compositional ranges for x are 6 to 20% for La and 3 to 15% for Nb, when y is 20%. The reduced polarizabilities voltages are consistent with integrated ferroelec. memories operating at 3.0 V and lower.
IT **261715-98-4**, Lead niobium titanium zirconium oxide

(Pb0.85-0.97Nb0.03-0.15Ti0.8Zr0.2O3) **261715-99-5**, Lead niobium titanium zirconium oxide (Pb0.94Nb0.06Ti0.8Zr0.2O3) **261716-00-1**, Lead niobium titanium zirconium oxide (Pb0.9Nb0.1Ti0.8Zr0.2O3)
RL: DEV (Device component use); PRP (Properties); USES (Uses)
(**ferroelec.** thin **films** of reduced tetragonality for FRAMs)

RN 261715-98-4 HCAPLUS
CN Lead niobium titanium zirconium oxide (Pb0.85-0.97Nb0.03-0.15Ti0.8Zr0.2O3) (9CI) (CA INDEX NAME)

Component	Ratio	Component Registry Number
O	3	17778-80-2
Zr	0.2	7440-67-7
Ti	0.8	7440-32-6
Nb	0.03 - 0.15	7440-03-1
Pb	0.85 - 0.97	7439-92-1

RN 261715-99-5 HCAPLUS
CN Lead niobium titanium zirconium oxide (Pb0.94Nb0.06Ti0.8Zr0.2O3) (9CI) (CA INDEX NAME)

Component	Ratio	Component Registry Number
O	3	17778-80-2
Zr	0.2	7440-67-7
Ti	0.8	7440-32-6
Nb	0.06	7440-03-1
Pb	0.94	7439-92-1

RN 261716-00-1 HCAPLUS
CN Lead niobium titanium zirconium oxide (Pb0.9Nb0.1Ti0.8Zr0.2O3) (9CI) (CA INDEX NAME)

Component	Ratio	Component Registry Number
O	3	17778-80-2
Zr	0.2	7440-67-7
Ti	0.8	7440-32-6
Nb	0.1	7440-03-1
Pb	0.9	7439-92-1

IC ICM H01L029-76
ICS H01L029-94; H01L031-062; H01L031-113; H01L031-119
CC 76-8 (Electric Phenomena)
Section cross-reference(s): 57, 75
IT Memory devices
(RAM (random access); **ferroelec.** thin **films**

of reduced tetragonality for FRAMs)

IT **Ferroelectric films**
Ferroelectric memory devices
Integrated circuits
(**ferroelec.** thin **films** of reduced tetragonality for FRAMs)

IT 106390-68-5, Lanthanum lead titanium zirconium oxide (La0.07Pb0.93Ti0.35Zr0.65O3) 115454-11-0, Lead titanium zirconium oxide (PbTi0.8Zr0.2O3) 261715-97-3, Lanthanum lead titanium zirconium oxide (La0.06-0.2Pb0.8-0.94Ti0.8Zr0.2O3) **261715-98-4**, Lead niobium titanium zirconium oxide (Pb0.85-0.97Nb0.03-0.15Ti0.8Zr0.2O3) **261715-99-5**, Lead niobium titanium zirconium oxide (Pb0.94Nb0.06Ti0.8Zr0.2O3) **261716-00-1**, Lead niobium titanium zirconium oxide (Pb0.9Nb0.1Ti0.8Zr0.2O3)
RL: DEV (Device component use); PRP (Properties); USES (Uses)
(**ferroelec.** thin **films** of reduced tetragonality for FRAMs)

L18 ANSWER 105 OF 107 HCAPLUS COPYRIGHT 2006 ACS on STN
1972:411006 Document No. 77:11006 Performance of sputtered Pb0.92Bi0.07La0.01(Fe0.405Nb0.325Zr0.27)O3 **ferroelectric** memory **films.** Atkin, R. B. (Res. Lab., IBM, San Jose, CA, USA). Ferroelectrics, 3(2-3-4), 213-15 (English) **1972.** CODEN: FEROA8. ISSN: 0015-0193.

AB The ferroelec. behavior of sputtered Pb0.92-Bi0.07La0.01(Fe0.405Nb0.325Zr0.27)O3 films was evaluated for possible use in a ferroelec.-photoconductor memory. The material was sputtered onto Pt film substrates which also served as the lower electrodes. Au dots were evapd. through a mask onto the surface of the ferroelec. to form the upper electrodes. Hysteresis loops showed the films could be switched rapidly at very low voltages, but loop squareness decreased substantially at lower frequencies. This decrease in Pr corresponds to spontaneous depoling of the ferroelec. Switching and depoling were studied with rectangular voltage pulses. The rate and extent of depoling were detd. by poling dots and measuring the charge stored after various times. Depoling occurs rapidly during the first few msec and then relatively slowly. Depoling was also monitored with low-voltage, alternating polarity, disturbing pulses applied to the dot. These disturbing pulses were 5% of the switching voltage and should simulate the noise or dark signal that would be repetitively applied to unaddressed bit positions in a ferroelec.-photoconductor memory. These disturb pulses did accelerate depoling, but not an intolerable amt. Switching fatigue was evaluated with sine wave and rectangular voltage pulse excitation. Degradation was not significant before .apprx.109 polarization reversals. These **ferroelec. films** have characteristics suitable for certain memory applications.

IT **12777-88-7**
RL: DEV (Device component use); USES (Uses)
(**ferroelec.** sputtered **films** from bismuth- and

lanthanum-contg., for memory devices)
RN 12777-88-7 HCAPLUS
CN Iron lead niobium zirconium oxide (9CI) (CA INDEX NAME)

Component	Ratio	Component Registry Number
O	x	17778-80-2
Zr	x	7440-67-7
Nb	x	7440-03-1
Pb	x	7439-92-1
Fe	x	7439-89-6

CC 71-6 (Electric Phenomena)
ST sputtered **ferroelec film**; photoconductor ferroelec memory; lead ferrate niobate ferroelec
IT **12777-88-7**
RL: DEV (Device component use); USES (Uses)
(**ferroelec.** sputtered **films** from bismuth- and lanthanum-contg., for memory devices)
IT 7439-91-0, uses and miscellaneous 7440-69-9, uses and miscellaneous
RL: DEV (Device component use); USES (Uses)
(**ferroelec.** sputtered **films** from iron lead niobium zirconium oxide contg., for memory devices)

L18 ANSWER 106 OF 107 HCAPLUS COPYRIGHT 2006 ACS on STN
1972:411003 Document No. 77:11003 Design and performance of a thin **film ferroelectric**-photoconductor storage device.
Chapman, D. W.; Mehta, R. R. (Syst. Dev. Div., IBM Corp., San Jose, CA, USA). Ferroelectrics, 3(2-3-4), 101-6 (English) **1972.**
CODEN: FEROA8. ISSN: 0015-0193.
AB A new configuration of a ferroelec./photoconductor (FE/PC) memory chip is described. The substrate electrode is divided into 3 islands; a bus bar and 2 ground or ref. islands. A 1 μ **film** of the **ferroelec.** Pb0.92Bi0.07-La0.01(Fe0.405Nb0.325Zr0.27)O3 is sputtered on the 2 ground or ref. islands. A discontinuous film of Au is deposited on the ferroelec., and a CdSe photoconductor .apprx.0.7 μ thick is evapd. on the entire surface, **covering** the **ferroelec.** and bus bar. The top "transparent electrode" consists of a pattern of thin strips of Au 2 μ wide, sepd. by 4 μ spaces, covering the entire surface of the device, which measures 1.27 + 1.27 cm. Two light beams are used to access the device. In comparison with prior art designs, this design yields a redn. of .apprx.1000 in the noise from the unaddressed area of the device, permitting easier detection of signals from the addressed spots. The charging time consts. for the strips are quite satisfactory for switching the device in 50 μsec. Exptl. data showing the functioning of the device are presented.
IT **12777-88-7**
RL: DEV (Device component use); USES (Uses)

(ferroelec. substances, contg. bismuth and lanthanum, in ferroelec.-photoconductors storage ddevices)

RN 12777-88-7 HCAPLUS

CN Iron lead niobium zirconium oxide (9CI) (CA INDEX NAME)

Component	Ratio	Component Registry Number
O	x	17778-80-2
Zr	x	7440-67-7
Nb	x	7440-03-1
Pb	x	7439-92-1
Fe	x	7439-89-6

CC 71-6 (Electric Phenomena)

IT Memory devices
(**ferroelec.**-photoconductor **film**)

IT Photoconductors
(memory devices from **films** of **ferroelec.** substances and)

IT **12777-88-7**
RL: DEV (Device component use); USES (Uses)
(ferroelec. substances, contg. bismuth and lanthanum, in ferroelec.-photoconductors storage ddevices)

L18 ANSWER 107 OF 107 HCAPLUS COPYRIGHT 2006 ACS on STN

1966:40232 Document No. 64:40232 Original Reference No. 64:7482d-f
Current from a shock-loaded short-circuited ferroelectric ceramic disk. Halpin, W. J. (Sandia Lab., Albuquerque, NM). Journal of Applied Physics, 37(1), 153-63 (English) **1966.** CODEN: JAPIAU. ISSN: 0021-8979.

AB Thin circular disks of polarized ferroelectric ceramics were equipped with electrodes on their faces, and the electrodes were connected by a short circuit. Each disk was traversed by a stress wave, and the resulting current pulse through the short circuit was measured. The stress wave was generated by impact and made to propagate along the disk axis in a direction opposite to that of polarization. Current-pulse data are presented from tests with Pb0.99Nb0.02(Zr0.95Ti0.05)0.98O3, both normally sintered and hot-pressed, and with Pb0.99Nb0.02(Zr0.68Ti0.07Sn0.25)0.98O3 for impact stresses ranging from a few to several tens of kilobars. Over this range of stress both the shape of the current pulse and its time integral are strongly stress dependent. This behavior results from the combined effects of stress on (1) remanent polarization (2) polarizability, and (3) conductivity of the **ferroelectric** material **enveloped** by the wave. In a narrow range of stress where remanent polarization is reduced to near zero and where conductivity is negligible, the observed behavior can be adequately described by means of a mathematical model which is developed. The model includes the effect of stress wavefront tilt which occurs in impact experiments to an extent that influences significantly the character of the current pulse. Some

conclusions are drawn about permittivity of shock-loaded ferroelectrics and the extent to which remanent polarization is affected by the rapidly applied large electric fields which accompany the process of current production.

IT **56572-83-9**, Lead niobium titanium zirconium oxide
(elec. current from shock-loaded short-circuited disk of)

RN 56572-83-9 HCAPLUS

CN Lead niobium titanium zirconium oxide (9CI) (CA INDEX NAME)

Component	Ratio	Component Registry Number
O	x	17778-80-2
Zr	x	7440-67-7
Ti	x	7440-32-6
Nb	x	7440-03-1
Pb	x	7439-92-1

CC 9 (Electric and Magnetic Phenomena)

IT 37323-27-6, Lead niobium tin titanium zirconium oxide
56572-83-9, Lead niobium titanium zirconium oxide
(elec. current from shock-loaded short-circuited disk of)

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